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ABSTRACT

This report describes the APL (Accountable unit, Program, and line item) budget system, a computerized three-dimensional program budget system that has been implemented in the Cambridge (Massachusetts) School Department. Various chapters discuss the differences between traditional budgeting and program budgeting, present an overview of te APL system, describe the implementation of the APL system in the Cambridge School Department, and provide an indepth analysis of the APL system and some of the difficulties encountered during its implementation at Cambridge. A glossary of important terms and sample budget forms and output budget reports for the APL system are included in the appendix. (JG)

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A COMPUTERIZED THREE-DIMENSIONAL PROGRAM BUDGET AND ITS IMPLEMENTATION AT CAMBRIDGE SCHOOL DEPARTMENT

S. GODWIN WONG

JUNE 1975

HARVARD GRADUATE SCHOOL OF EDUCATION
CAMBRIDGE, MASSACHUSETTS

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ABSTRACT

This document describes a computerized three-dimensional program budget system which has been designed and implemented at Cambridge (Massachusetts) School Department. Related financial, technical and organizational problems are discussed. Input budget forms and output budget reports are also included, together with literature review and a glossary. Its applicability and transferability to other school districts are addressed.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Since the initial implementation of the Planning-Programming-Budgeting System (PPBS) in the Department of Defense in 1961 (Hartley, 1968, p. 83, p. 256; Petruschell, 1968, p. 1-2), it has been widely practised in government agencies, institutions of higher education, school districts, commercial industries, and other organizations.

Farmer (1970, p.1) suggested that the implementation of PPBS can be accomplished in three ways: planning studies, evolutionary development of PPBS, and the "turn-key" change-over to PPBS.

This paper will describe a new budgetary system for handling general funds* of a local school district and problems related to the development of the "turn-key" change-over to the new system, which is a modification of a PPBS.

The modified budget is called an APL budget to indicate the first initials of the three major coordinates of the budget format: Accountable Unit, Program and Line Item (Object).**

Depending on each local school district, different approaches may be taken. This paper will utilize the case study of Cambridge School Department to lay out some of the difficulties related to the preparation and implementation of the APL budget.

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* With the addition of a fourth dimension for fund source, the same system may be applicable to incorporate all the expenditures of a local school district.

** The terms will be discussed in more detail in later chapters.

In addition to presenting the characteristics of the proposed three dimensional budget, the paper will also discuss and attempt to answer questions associated with the following issues:

1. The major problems related to the development, preparation and implementation of the new budget in local school districts;
2. Possible solutions to the above problems; and
3. Possible improvements regarding the design of the budget.

1.2 ORGANIZATION OF THE PAPER

The next chapter gives a brief review of traditional budgets and program budgets. Basic features of the two and their differences will be discussed with major emphases placed upon the program budget. Implementation procedures and strategies of PPBS and its limitations will be included in the chapter. Several examples in program structures are also given as illustration.

Chapter 3 gives an overview of the APL budget, its conceptual design and its format. Diagrams are being used to depict its structure and ways of viewing the budget.

Chapter 4 describes in detail the implementation of APL budget at Cambridge School Department. The program structure will be listed in full. The input budget forms and all the budget reports are being described and discussed to highlight the implementation process at the Cambridge School Department. A set of all the forms used is included in Appendix B for reference, while sample outputs of all the budget reports are displayed in Appendix C. A list showing the stages of budget preparation is also given at the end of that chapter.

An analysis of the APL budget starts in Chapter 5. The intention of the analysis is to describe some of the problems and difficulties encountered at the Cambridge School Department during the different phases of implementation of the new budgetary system. Special attention and emphases will be given to the fiscal control of a budget. Budget preparation, budget formulation, budget presentation, and accounting information will be the main focus of discussion in that chapter.

Chapter 6 concludes the paper with a summary. Besides the bibliography at the end of the paper, a glossary is compiled in Appendix A.

CHAPTER 2

PLANNING-PROGRAMMING-BUDGETING SYSTEM

2.1 GENERAL

It is not the intention of this paper to discuss the details of PPBS. However, a brief exposure to program budgets and budgets in general may be appropriate here. Literature on this topic is abundant. Therefore, the discussion below does not mean to be complete.

2.2 TRADITIONAL BUDGET

A budget is "a plan of action expressed in figures." (Horngren, 1972) The term "traditional budget" will be used to mean the kind of budget format which has been in existence before the introduction of the program budget. A traditional budget usually is in a line item (object) format, which generally is one-dimensional in nature. A line item budget by object may look something like the following:

A	Salary
B	Contracted Services
C	Supply and Material
D	Equipment and Furniture
E	Special Funds

Each of the above groups has its own elements. For instance, the B category may include B1 Printing and Binding, B3 Advertising, B8 Light and Power, B10 Rental of Building, B31 Extermination Services, B89 Computer Services, and others.

The traditional budget, oriented toward the operation of the school system, uses functional categories to describe that operation, such as instruction and administration (Carpenter, 1969, p.2).

Another example of a traditional budget is the following one by function (Haggart, 1972, p.58-59):

100	Administration
200	Instruction
300	Health
500	Transportation
600	Operations
700	Maintenance
800	Fixed Charges
900	Food Service
1000	Community Service

Rather than being concerned with what is accomplished or what is gained, the traditional budget focuses on how various funds are spent. Costs are developed with respect to estimated income rather than needed activities. Piele and Bunting (1969) pointed out that traditional budgeting practices are essentially defensive and merely become some mechanical increment greater than last year's budget. On the other hand, line item budget has some good points because it is possible to make comparisons of amounts allocated to items in other school systems. (FitzSimmons, 1966, p.3)

2.3 PROGRAM BUDGET

The origin of program budgeting was traced back by Mosher (1954, p. 79) to the "cost-data" budgeting which was applied to the public works activities of the Borough of Richmond in New York City in 1912, and the "performance budgeting" which was applied in Richmond, Virginia in 1949.

The implementation of the Planning-Programming-Budgeting System in the Department of Defense in 1961 and the promotion of PPBS fostered by President Johnson in 1965 have prompted the adoption of program budgeting by government agencies, business corporations, school districts and other organizations (Novick, 1969; Durstine and Howell, 1970; Pyhrr, 1973, p.142; Hartley, 1968; Petruschell,1968.)

In short, a program budget is

> A budget that identifies costs by program areas rather than the traditional state-prescribed categories of salaries, supplies, equipment and other expenses.*

In detail, a program budget is

> A resource allocation technique which facilitates the organization and identification of the activities of an institution in terms of its objectives, displays the cost of these activities over an extended time frame, and relates these activities and their costs to the outputs of the institution's programs. (Gulko, 1972, p. 120)

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* Chappaqua Public Schools, *Chappaqua Schools Budget Summary, 1973-74.*

Thus, a program budget takes on the format of attaching budgeted amount to programs rather than to line items. According to the School District of Philadelphia (1970, p.13), a program is a set of related activities which embodies or expresses one or more major goals of the School District and a program may be instructional, or non-instructional. FitzSimmons (1966, p.5), by defining a program as any field of study or activity engaged in by the Students of a school district, limits a program to student-related activities. This latter definition seems to be inadequate because not all activities of a school district are engaged in by students, at least not directly.

2.4 TRADITIONAL BUDGET AND PROGRAM BUDGET

There are ample literature on the description and comparison of the traditional budget and the program budget. (Haggart, 1972; Durstine and Howell, 1970; Carpenter, 1969; Petruschell, 1968; Hirsch, 1972; Scurrah and Shani, 1974) This section will only attempt to highlight some of the more salient characteristics of the two kinds of budgets.

The major differences between the program budget and the traditional budget can be categorized under three headings:*

1. Content: The differences in content between the two budgets are due primarily to differences in the completeness of description of the proposed plan. The traditional budget ordinarily includes detailed physical resources data only on those resources required for current operation. The complete program budget, on the other hand, besides including a full description of the physical resources required for the implementation of the budget plan, also contains data on the objectives, enrollment, and the key design and operational characteristics of each program.

2. Structure: The program budget is organized with reference to objectives, as embodied in the various programs and program elements; while the traditional budget related primarily to organizational units and functions.

3. Time Horizon: The program budget shows the resources requirements for a longer time period (usually many years) than the traditional budget (usually a single fiscal year).

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* J.A. Dei Rossi, "The Program Budget and the Traditional Budget" in Program Budgeting for School District Planning: Concepts and Applications, edited by Sue A. Haggart, Educational Technology Publications, 1972, p. 46.

Adding to the above differences, a program budget facilitates and emphasizes the need and importance of "analysis" and "evaluation" often in the form of cost-benefit or cost-effectiveness studies. Furthermore, by token of its structure and the way the budget is formulated, a program budget also makes possible calculations of unit costs according to programs, although the reallocation of indirect costs may be difficult and questionable.

A linkage between the program budget and the traditional budget is generally referred to as a "crosswalk", which is the expression of the relationship between them. A crosswalk is basically a tabular array, with the columns showing the traditional budget cost categories and the rows showing the program budget cost categories.* However, although crosswalk translations are possible, it should not be mistaken that program budget is simply a display of the traditional budget in a different format. It is the structure, the emphases and the processes but not simply the format of a program budget that make it different from the traditional budget.

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* J.A. Dei Rossi, "The Program Budget and the Traditional Budget" in Program Budgeting for School District Planning: Concepts and Applications edited by Sue A. Haggart, Educational Technology Publications, 1972, p. 47.

2.5 PROGRAM STRUCTURE

For a program budget format, of more importance than the distinct separation of programs is the program structure itself. A program structure is a classification system that categorizes the activities of an organization according to their relationship to the organization's objectives,* and it facilitates analytic comparisons of the costs and effectiveness of alternative programs. (Hartley, 1968, p.257)

How the program structure is designed also determines the ways the program budget can be displayed and analyzed. Emphases may be different from one program structure to another. Barro* suggested three heirarchies for a program structure of a school district: (1) Categorization of activities according to subject-oriented learning objectives, (2) Categorization by type of student, and (3) Categorization by level of education. Tagle (1970, p.5) discussed four basic program structures which are (1) curriculum oriented, (2) building oriented, (3) grade level oriented, and (4) service oriented.

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* S.M. Barro, "Development of a Program Structure" in Program Budgeting for School District Planning: Concepts and Applications, Sue A. Haggert (ed.) Educational Technology Publications, 1972.

Hirsch (1972, p.17) mentioned the following criteria for educational program structure:

1. output or objective orientation,
2. multiyear dimension,
3. comprehensiveness,
4. heirarchical structure,
5. client orientation,
6. conceptual clarity,
7. administrative relevance, and
8. fiscal relevance.

One of the examples of program structure illustrated by Haggart (1971; 1972) is given below. This structure categorizes activities into programs according to (1) their relationship to educational objectives, (2) type of students, and (3) level of instruction:

1. Fundamental Intellectual Skills
    - 1.1 Regular students
        - 1.1.1 Early childhood
        - 1.1.2 Elementary-lower grades
        - 1.1.3 Elementary-upper grades
        - 1.1.4 Junior high school
        - 1.1.5 High school
    - 1.2 Disadvantaged students
        - 1.2.1 Early childhood
        - 1.2.2 Elementary-lower grades

          . . .
    - 1.3 Physically handicapped
        - 1.3.1 Early childhood

          . . .
    - 1.4 Educable mentally retarded
2. Learning about the world
    - 2.1 Regular students
        - 2.1.1 Early childhood

          . . .
    - 2.2 Disadvantaged students

      . . .
3. Development of the Individual Physically, Socially, and Emotionally

   . . .

etc.

In a program budget format, the "function" and "program" dimensions are merged into a single dimension to become a cost center in actual system practice.* The United States Federal Government budget for fiscal year 1975 uses the following functions and subfunctions, which are comparable to programs and subprograms:**

- National Defense:
  - Department of Defense -- Military
  - Military assistance
  - Atomic energy
  - Defense-related activities
- International Affairs and Finance:
  - Conduct of foreign affairs
  - Economic and financial assistance
  - Foreign information and exchange activities
  - Food for Peace
- Space research and technology:
  - Manned space flight
  - Space science and applications
  - Space technology
  - Supporting space activities
- Agriculture and rural development:
  - Farm income stabilization
  - Rural housing and public facilities
  - Agricultural land and water resources
  - Research and other agricultural services
- Natural resources and environment:
  - Water resources and power
  - Land management
  - Mineral resources
  - Pollution control and abatement
  - Recreational resources
  - Other natural resources programs

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* National Center for Educational Statistics. Financial Accounting: Classifications and Standard Terminology for Local and State School Systems. U.S. Government Printing Office, 1973.

** Office of Budget and Management, The Unites States Budget in Brief Fiscal Year 1975, U.S. Government Printing Office, 1974.

- Commerce and transportation:
    - Air transportation
    - Water transportation
    - Ground transportation
    - Postal service
    - Advancement of business
    - Area and regional development
    - Regulation of business
- Community development and housing:
    - Community planning, management, and development
    - Low and moderate income housing aids
    - Maintenance of the housing mortgage market
- Education and manpower:
    - Higher education
    - Elementary and secondary education
    - Vocational education
    - Consolidated educational grants
    - Other education aids
    - General science
    - Manpower training and employment services
    - Other manpower aids
- Health:
    - Development of health resources
    - Financing or providing medical services
    - Prevention or control of health problems
- Income security:
    - Retirement and disability
    - Unemployment insurance
    - Public assistance
    - Social services
- Veterans benefits and services:
    - Income security
    - Education, training, and rehabilitation
    - Housing
    - Hospital and medical care
    - Other veterans benefits and services
- Interest
- General government:
    - Legislative functions
    - Judicial functions
    - Central fiscal operations
    - Law enforcement and justice
    - General property and records management
    - Other general government
- General Revenue Sharing
- Allowances:
    - Acceleration of energy research and development
    - Civilian agency pay raises
    - Contingencies
- Undistributed intragovernmental transactions:
    - Employer share, employee retirement
    - Interest received by trust funds

Each of the above subprograms is further disaggregated into other elements. For example, the following shows the program structure of the health function:*

Health:

- Development of Health resources
    - Increasing knowledge
    - Providing facilities and equipment
    - Increasing and improving the health manpower pool
    - Improving the organization and delivery of health services
- Prevention and control of health problems
    - Disease prevention and control
    - Physical environment control
    - Consumer protection
    - Social factors affecting health
- Provision of health services
    - Health services for the aged
    - Health services for the poor
    - Health services for Indians
    - Health services for children and mothers
    - Other health services
- General support
    - Scientific and health information
    - Program direction and management.

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* David Seidman, "PPB in HEW: Some Management Issues" in Planning-Programming-Budgeting, ed. by Fremont Lyden and Ernest Miller, Rand McNally, 1972, p.318.

2.6 PPBS

The formulation of a budget is only a part of the entire budgetary process, which includes continuous activity comprised of planning, formulation of a budget document, interpretation, presentation to the approving authority, formal adoption, fiscal administration and appraisal. (Hartley, 1968) A Planning-Programming-Budgeting System (PPBS) encompasses the entire spectrum of planning, administration and management.

Essentially a systems approach to planning (Tagle, 1970, p.1), PPBS is:

> A management system involving the selection or identification of the overall, long-range objectives of the organization and the systematic analysis of various courses of action in terms of relative costs and benefits (Planning); deciding on specific courses of action to be followed in carrying out planning decisions (Programming); and translating planning and programming decisions into specific financial plans (Budgeting). (Gulko, 1972, p.119)

The conceptual framework of PPBS can be briefly but concisely depicted by Figure 1 (Durstine and Howell, 1970, p.14):

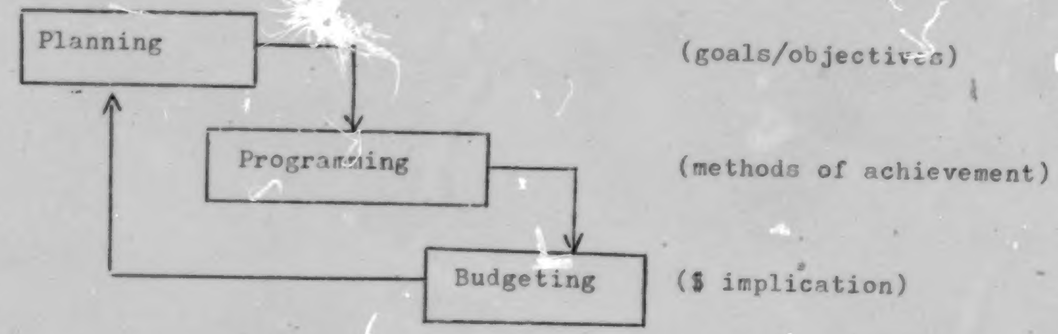

Figure 1. Conceptual Framework of PPBS

The hallmarks of PPBS are: (1) specification of the objectives to be achieved, (2) investigation of alternative means of achieving the objectives, (3) minimization of the costs or comparison of costs and benefits (when the benefits can be quantified), and perhaps most important, (4) systematic use of analysis throughout the process. (Ott and Ott, 1969)

A program budget is sometimes being mistaken as just another new accounting procedure and PPBS as a new budgetary process. Many authors (Gulko, 1972, p.4) were vigorous and careful in pointing out that PPBS is not to be taken just as a new accounting system nor is it a more effective bookkeeping system. Archibald (1970, p.2) stressed that PPBS "... is not just a change in budgetary format, but an attempt to change the process by which resources are allocated. In particular, it is an attempt to make that process more rational so that you have got a better chance of going where you really want to go and of not paying more than you have to for the trip."

Although the term program budget has sometimes been used in a broad sense to denote the entire process of PPBS (FitzSimmons, 1966), a distinction between the two may deem helpful for the rest of the paper. Addressing the confusion between program budget and PPBS, the American Institute of Certified Public Accountants (1972, p.18) aptly points out that program budget "... does not employ the explicit, written objectives, the in-depth cost-benefit analysis, or the evaluation techniques that are integral parts of PPBS." For the rest of the paper, the term program budget will be used to mean only the budgeting part of the entire PPBS which is composed of the three phases of planning, programming, and budgeting.*

---

* A PPBS usually includes also an evaluation phase, thus making it a PPBES. The issue of evaluation will be discussed later in the paper.

2.7 WHY PPBS?

In President Johnson's 1965 directive ordering all federal agencies to adopt PPB techniques, five reasons were stated for its adoption:

1. To identify national goals with greater precision and determine the priority among goals.

2. To develop and analyze alternative means of achieving the goals.

3. To project long-term systems costs and relate them to the benefits of each program.

4. To specify plans for several years ahead that will achieve the stated objectives.

5. To strengthen control over programs and budgets through improved measurement and analysis of program performance in relation to cost.

A PPBS formulation can, as Farmer (1970) pointed out, provide additional insight into program changes by identifying resource requirements, and developing costs by program tends to improve understanding of objectives and outputs. PPBS also provides great visibility to the decision making process particularly in reference to the allocation of resources (Parden, 1970, p.8).

Another attraction of PPBS is the fact that it is the first budget system designed to accommodate the multiple functions of budgeting, namely, strategic planning, management control and operational control. (Schick, 1966)

Parden (1970, p.2) pointed out the following reasons why colleges and universities have an increased interest in PPBS:

1. There is an increased competition with other social programs for limited funds. Program budgeting seeks to strengthen the justification for additional funds.

2. Program budgeting has been adopted by the federal government and is now being followed by an increasing number of state agencies. Many colleges and universities will be forced to use this format because it will be required by the agencies to whom they must submit requests.

3. Because funds are less plentiful, there is a growing interest in increased effectiveness.

4. The mechanics of governance in colleges and universities are receiving greater attention by all those who wish to increase their participation in directing the future of the institution. Program budgeting may insure that this participation can be accommodated on an orderly basis.

5. When there are considerably more projects or programs seeking support than there are funds to support them, institutional priorities must be very carefully established.

6. The major attractiveness of program budgeting to those who are directly involved in college and university administration is the hope that the procedure will provide a handle by which to grasp the essence of increasingly complex institutions.

The above reasons are also true with school districts, which have showed increased interest in using PPBS.

Above all, with the recent emphasis on accountability, it seems that PPBS is a very useful tool in helping to perform the necessary analysis, as well as providing relevant data for doing so.

2.8 BUDGET PROCESS

It will be overgeneralized to propose any standard budget process. However, with some minor modification, most budget processes have the following four interrelated phases as being used in the budget process of the Federal Government:*

1. executive formulation and transmittal,
2. congressional authorization and appropriation,
3. budget execution and control, and
4. review and audit.

The budget process should not be thought of as a set of discrete activities starting with step 1 above and ends with step 4. Rather, the process is a continuous circular loop by itself. The review and audit of a budget, assisted by accounting and financial reporting, constitute a starting point for the formulation of the next fiscal one. Just as every budget is heavily influenced by past commitments, each budget in turn strongly influences those that follow.**

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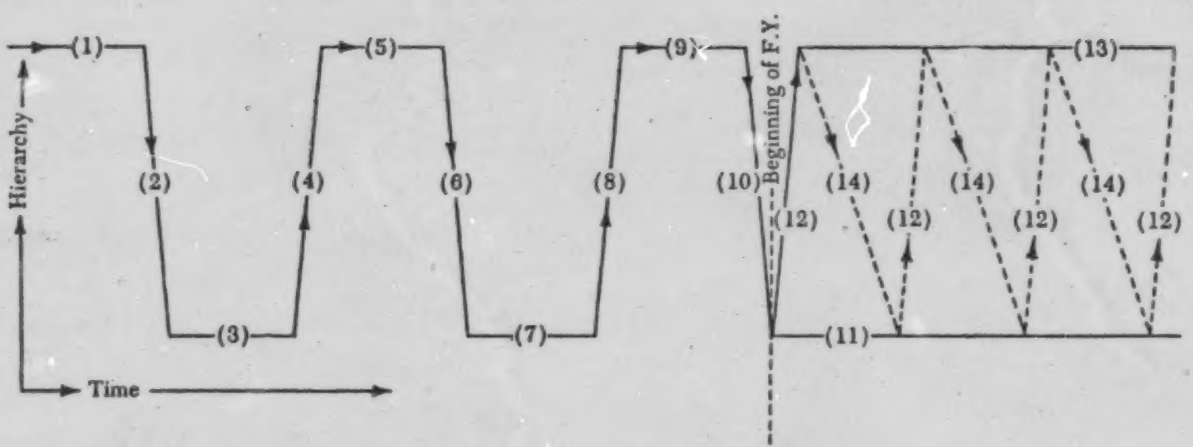
* Office of Management and Budget, The United States Budget in Brief Fiscal Year 1975, U.S. Government Printing Office, 1974, p.41.

** Ibid, p.8

In regard to the schema of the budget process, Mosher (1954, p.133) discussed that

> The "ideal" budget process should ... be designed to facilitate or even necessitate that decisions be made at the right points in the organization and at the proper times. As information moves upward in the organization, it becomes more various and comprehensive in scope and less specific in manageable detail. The possible types of decisions at top levels become "strategic" or generalized since they must apply to a wide variety of areas and functions. As information moves downward, the reverse is true. The pertinent information must be increasingly specific and "operational"... Another aspect of the process is that it is sequential; one step follows another in more or less orderly fashion. The generalized pattern of basic steps may be described as: Objectives → Plans → Authorization of Means → Operations.

Figure 2 is what he termed as "an oversimplified graphic presentation of the "model" budget process."



Steps

(1) Determination of program and budget policy
(2) Interpretation and specification
(3) Development of estimates
(4) Review, coordination, and consolidation of estimates
(5) Appropriation
(6) Interpretation and instructions for funding estimates
(7) Development of funding plan
(8) Review, coordination, and consolidation

Steps

(9) Apportionment of funds; adjustment of program
(10) Allocation and allotment of funds; operating program schedules
(11) Operations and obligation of funds
(12) Reports on program and budget
(13) Review and analysis of program and budget and revisions as necessary
(14) Directives revising program and funding

Figure 2. Conceptual Pattern of the Budget Process in Relation to Organizational Heirarchy.

2.9 IMPLEMENTATION PROCEDURES AND STRATEGIES:

There are quite a wide range of implementation procedures and strategies being used by school districts, organizations and institutions. Some emphasize the mechanism of the system, others the development of objectives, while still others its organizational aspects.

When the Public Schools of Brookline, Massachusetts first implemented PPBS in 1970, Tagle (1970, p.3) suggested four major stages to its implementation:

1. Study and orientation
2. Determination of program structure
3. Development of goals and objectives
4. Development of alternative proposal.

Plans to develop and implement PPBS in Fairfax County were in several phases:*

1. The identification of existing programs to determine objectives,
2. The projection into the future all interrelated programs over a five-year period,
3. Compilation of agency projections into a summarized form showing programs grouped under related objectives and projected over the future five years,
4. The testing of the feasibility of projections by drawing schedules showing the projected revenues over the time period,
5. The conversion of completed work to data processing,
6. The preparation of a procedural manual,
7. The preparation of a survey report on progress achieved and future work required.

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* Robert A. Luther, "PPBS in Fairfax County: A Practical Experience" in Planning-Programming-Budgeting edited by Fremont J. Lyden and Ernest G. Miller, Rand McNally, 1972, p.345-357.

Sullivan (1972) proposed the following guidelines and requirements for the development of a PPBS for a school district:

1. Consistent with the requirement of PPBES,* if to be implemented in future.
2. Take into account current requirements for financial accounting of (a) School system, (b) City (c) State and (d) Federal Government, USOE.
3. Processing by computer.
4. Expandable to allow for addition or revision of program.
5. Flexible for future modifications.
6. A good program-expenditure reporting system for analysis and for budget planning.

Figure 3 gives a comprehensive flow chart for PPBS implementation by a local school district (Hartley, 1968, p.158).

The American Institute of CPA (1972) elaborated certain key tasks facing the implementation of a program budgeting system:

1. The district must list its existing and anticipated programs in a hierarchical arrangement reflecting, as far as possible, the district's educational philosophy and the various interrelationships among programs. This ... program structure will serve as the basis for developing the program budget.
2. The district should recast the existing operating budget into a program format so that district personnel who will be preparing a program budget for the first time will have a concrete model of what is sought and some basis of dollar comparison.
3. Keeping in mind what has already been noted about avoiding hastiness in scheduling change, the district should develop a budget work-program which will:
   - Identify each task to be done.
   - Designate persons responsible for each step.
   - Set target dates for initiation and completion.
4. The next step is to obtain the superintendent's budget guidelines.
5. The forms and procedures should include:
   - A brief description of each program -- major elements, enrollment projections, and so on.
   - The desired results of each.
   - Written requests for program changes.
   - Identification of all program costs, including personnel.

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* PPBES is sometimes being used to denote PPBS with the addition of the word "Evaluation" for emphasis.

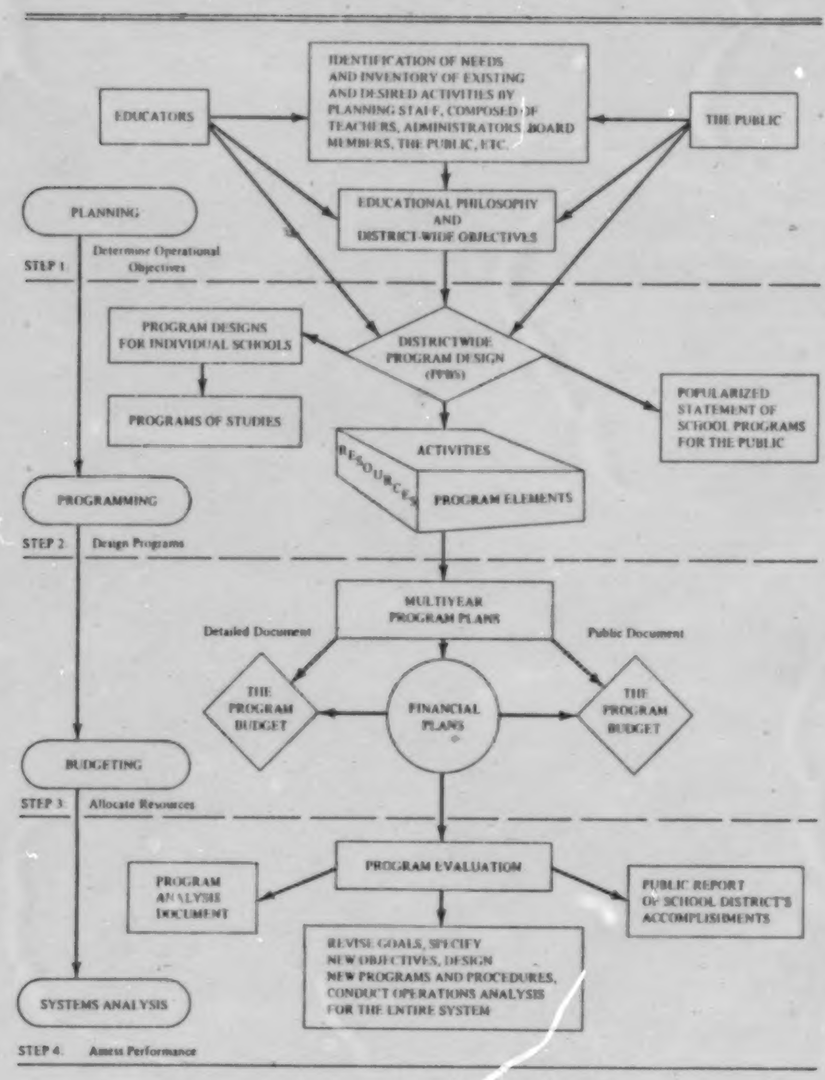
IDENTIFICATION OF NEEDS AND INVENTORY OF EXISTING AND DESIRED ACTIVITIES BY PLANNING STAFF, COMPOSED OF TEACHERS, ADMINISTRATORS, BOARD MEMBERS, THE PUBLIC, ETC.
EDUCATORS
THE PUBLIC
PLANNING
EDUCATIONAL PHILOSOPHY AND DISTRICT-WIDE OBJECTIVES
STEP 1
Determine Operational Objectives
PROGRAM DESIGNS FOR INDIVIDUAL SCHOOLS
DISTRICTWIDE PROGRAM DESIGN (PPBS)
PROGRAMS OF STUDIES
POPULARIZED STATEMENT OF SCHOOL PROGRAMS FOR THE PUBLIC
ACTIVITIES
RESOURCES
PROGRAM ELEMENTS
PROGRAMMING
STEP 2
Design Programs
MULTIYEAR PROGRAM PLANS
Detailed Document
Public Document
THE PROGRAM BUDGET
FINANCIAL PLANS
THE PROGRAM BUDGET
BUDGETING
STEP 3
Allocate Resources
PROGRAM EVALUATION
PROGRAM ANALYSIS DOCUMENT
PUBLIC REPORT OF SCHOOL DISTRICT'S ACCOMPLISHMENTS
REVISE GOALS, SPECIFY NEW OBJECTIVES, DESIGN NEW PROGRAMS AND PROCEDURES, CONDUCT OPERATIONS ANALYSIS FOR THE ENTIRE SYSTEM
SYSTEMS ANALYSIS
STEP 4
Assess Performance

Figure 3. Flow Chart for PPBS Implementation by a Local School District

The recasting (the crooswalk, as many other authors have been using) of the existing budget (line item budget) into a program budget constitutes a major role in the implementation of a PPBS. It was pointed out by the Institute of CPA (1972, p.23) that a school district using a program budget system can continue accumulating cost in the old (function/object) format, and then periodically recast the expenditures by program for review and analysis. This, however, poses some potential problems which will be discussed in a later section.

For institutions of higher education, three levels of participation may be categorized. These include:

1. Special planning studies using PPBS techniques,

2. An evolutionary implementation which supplements traditional planning methods with PPBS-type studies and parallels the current budget system with a program budget, and

3. A "turn-key" conversion to PPBS with the concomitant changes in procedure and organization. (Farmer, 1970, p.20)

Since PPBS may lead to significant organizational change, it may be advantageous for an institution to progress through the levels of participation until, through evolution, a full PPBS system has been installed. Farmer (1970) also pointed out that concurrent with this organizational change, an information system should be developed to support the data requirements of planning, and procedural changes should be made to implement planning through program budgeting rather than the traditional procedures. Such a "turn-key" approach requires a significant investment and, frequently, outside assistance.

2.10 LIMITATIONS OF PPBS

Together with its improvements over the present budgeting system and advancements to the planning process, PPBS brings with it some limitations too. The greatest difficulty, as many authors have pointed out "is the estimation of costs. How should general costs such as for plant, maintenance, capital library, administration, and so on, be allocated over various projects?" (Piele, 1970)

In higher education, much effort has been devoted to the design of procedures and methods, by which indirect cost and costs in support services may be meaningfully redistributed to primary programs for the purpose of accountability and the calculation of unit cost.*

Farmer (1970) pinpointed the following three significant conceptual problems in implementing PPBS for institutions of higher education:

1. It is difficult to identify the outputs of higher education.

2. There is no single organization unit which produces a unique output.

3. Production functions for higher education are not known.

While the above were addressed to higher education, they are equally valid in education of any level and in education in general.

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* Refer to the many publications by National Center for Higher Education Management Systems (NCHEMS) at The Western Interstate Commission for Higher Education (WICHE).

Peterson (1971) raised an important conceptual problem in program budgeting. This involves the fact that a program head may find many costs on his program budget over which he has little or no control. He also pointed out a couple of technical problems associated with PPBS. One is the very difficult problem of defining what should constitute a program. Another is the arduousness of finding a rational basis for allocating costs to the various programs.

Many authors, in addressing the limitations of PPBS, have brought up the problems regarding data (McGilvery*; Dougharty, 1973, p.13; Piele, 1969) especially in regard to data reliability, data gaps, and data aggregation. Complicating the whole problem of educational cost estimation is the lack of adequate accounting systems and the fact that many educational activities cannot be unambiguously defined and quantified.

Stressing the point that the limitations of PPBS are outweighted by the potential advantages gained by this concept, Hartley (1968, p.251) numerates some of the limitations surrounding PPBS for school districts which are summarized below:

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* Francis E. McGilvery, "Program and Responsibility Cost Accounting", in Planning-Programming-Budgeting: A Systems Approach to Management edited by Fremont J. Lyden and Ernest G. Miller, Rand McNally and Company, 1972.

1. Program budgeting does not eliminate organizational conflicts.

2. It is subject to political considerations.

3. It does not prescribe a particular form or organization.

4. The United States Office of Education program structure is not suitable for local schools.

5. Every systems analysis has defects.

6. Long-range projections are subject to miscalculations.

7. There is opposition to planned change in education.

8. Public incapacity to understand the merits of program budgeting may result in a lack of financial support for implementation.

9. Evaluative criteria need refinements.

10. Program structures will not be uniform.

11. Programs may not be mutually exclusive.

12. Local schools have inadequate staffs for planning.

13. Conclusive evidence of the success of PPBS is not abundant.

14. Planning has its limits, and schoolmen should not be promised too much too soon after PPBS installation.

15. There exist a number of research needs into such technical operational elements as: systems analysis application and structural design; curricular program identification and instructional methodology; administrative procedures and evaluative methods; time sequence design and computer applications; and economic analysis and budgetary design.

CHAPTER 3

APL BUDGET

3.1 INTRODUCTION

This chapter will discuss the general design and the basic characteristics of the APL budget, which is simply a modification of a program budget. The APL budget is three-dimensional and derives its acronym from the names of its three coordinates. They are (1) Accountable Unit, (2) Program, and (3) Line Item. The terms will be defined in a later section.

The idea behind the design of such a three-dimensional program budget is to come up with a budget format and process which will

1. allow for better fiscal control and financial accountability,

2. enable a parallel design of a computerized program accounting system,

3. incorporate the features and advantages of a program budget, and

4. simplify the problem of data processing for its display, input, and update.

From a strict definitional point of view, the APL budget IS a program budget.

3.2 APL BUDGET STRUCTURE

Lindman (1968) proposed a three-dimensional program account classification system for public school as follows:

I. Type-of-school:
  1. prekindergarten
  2. elementary school
  3. junior high school
  4. senior high school
  5. adult/evening school
  6. summer school
  7. special school
  8. community services

II. Function-object:
  Instruction:
    1. principal's and supervisors' salary
    2. classroom teachers' salary
    3. other professional salary
    4. clerical and paraprofessional salary
    5. books
    6. instructional supplies
    7. instructional equipment
    8. other cost of instruction
  Support Services:
    1. administration
    2. operation of plant
    3. maintenance of plant
    4. pupil transportation
    5. other support services
    6. fixed charges

III. Scope-of-service (program):
  1. basic program
  2. vocational education
  3. special education
  4. compensatory education
  5. health services
  6. pupil transportation
  7. lunch program
  8. other supplementary programs.

The APL Budget structure is three dimensional. It can be conceptualized as a big rectangular box, segmented into tiny cells within the box by the subdivisions of the three coordinates, which are accountable unit, program and line item. All budgeted amounts, as well as their corresponding subsequently expended amounts all belong to unique cells of that rectangular box, which represents the entire budget of the school district.* That is to say, after the big box has been appropriately segmented into tiny cells and labelled, the formulation of a budget for the school district will then involve the allocation of amounts (or requested amounts) into the appropriate cells, which are meant for different combinations of accountable units, programs, and line items. The account number of a specific account will simply be a unique three-part code derived from its three coordinates. However, for the purpose of satisfying the requirements of accounting practice in most school districts, only the part of the code for line item may be used for reporting to governing boards and city councils, hence, cutting down the number of physical "accounts".

The three dimensions of the APL budget are briefly described below. They will be elaborated on in the next chapter.

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* Discussion here limits to general fund of the school district since general fund represents a major portion of the resources available to a school district. By adding a fourth dimension for fund source, the discussion may be extended to include all resources available to a school district.

1. Accountable Unit: This is a notion (term) being used to represent a combination of location (where programs take place or where programs are administered) and organizational unit (the entity which is responsible and is held accountable for the funds budgeted for that accountable unit.) This term is comparable, but not identical, to "responsibility center" and "cost center" used by many authors. It is also analogous to Principal Administrative Unit and Cost Control Center used by the School District of Philadelphia (1970). It can be thought of as a budgetary unit generally coinciding with the organization lines of the school district.

2. Program: Hartley (1968) defines program as a group of interdependent, closely related services or activities possessing, or contributing to, a common objective or set of allied objectives, and as "a package of subprograms, elements, components, tasks, and activities." However, the term program is activity-oriented here in this paper and will be used to mean a set of instructional, non-instructional and supportive activities engaged in by or for the students of a school district. Thus, although many programs fall within organizational lines, some of them do cut across several or all accountable units.

3. Line Item: Line item is equivalent to object class which is a grouping of like goods, services or personnel resources needed in carrying out activities and programs. Line items are generally being used for traditional budget formation appropriation, accounting reporting, and auditing. As a matter of fact, although many school districts have been using program budget format for the preparation of budgets, the budgets have to be transformed somehow into a line item format before submitting to governing boards or city councils for approval and appropriation.*

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* For instance, the city of Cambridge uses line items for the purpose of appropriation, accounting and control, regardless of how the budget was formulated by the departments.

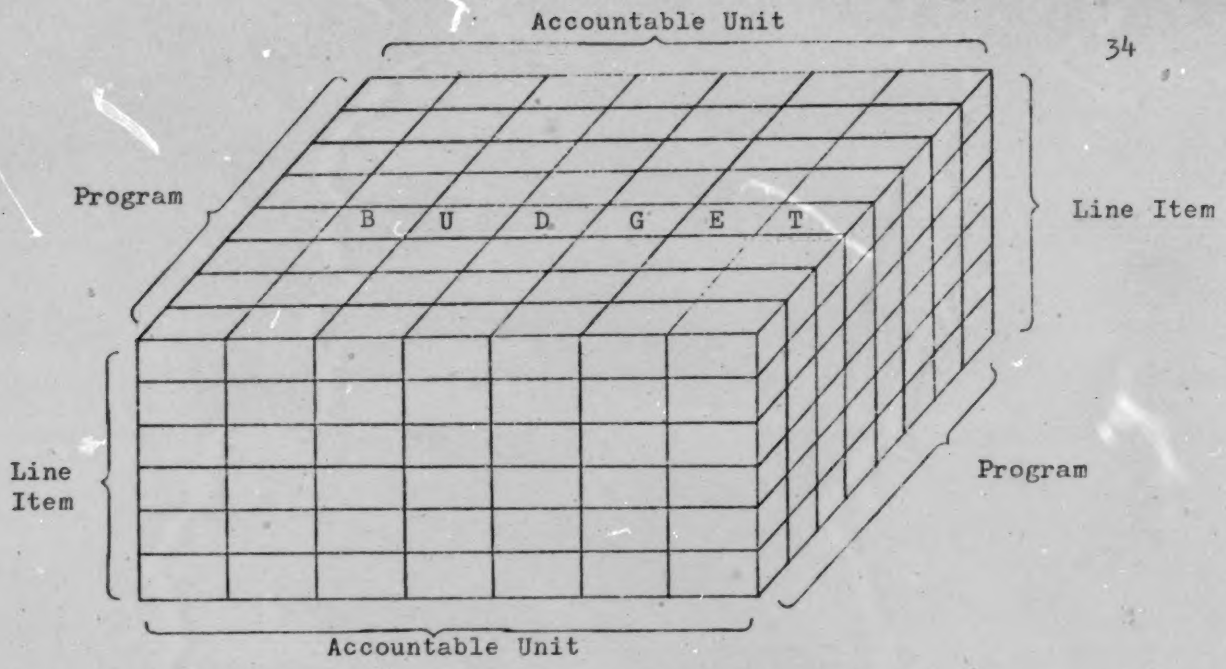

Figure 4. Conceptual Structure of APL Budget.*

Figure 4 depicts the conceptual structure of the APL budget. As can be seen intuitively from the figure, some of the cells are empty by virtue of the design because not every accountable unit has all the programs using all the line items available, although conceptually and theoretically any combination of the three coordinates is valid and possible.

By slicing the big box (the budget) into several cross-sections, the budget may be viewed differently in several ways.

The following are the three major ways of looking at the budget:

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* The relative number of subdivisions within each coordinate is for illustrative purpose only, and does not necessarily reflect the real situation.

1. 3-dimensional: This is the most disaggregated way of looking at or displaying the budget. By listing the contents (budgeted amounts) of every individual non-empty cell, it displays the greatest detail of the budget. This constitutes the basic elements of the budget, and is the starting point of the budget formulation. It tells precisely the amount being budgeted for accountable unit X, program Y and line item Z.

2. 2-dimensional: By holding two coordinates constant and summing across the entire third coordinate, the budget may be viewed as a relationship between the first two coordinates, holding the third constant. This is analogous to summing the contents of how much is being allocated to accountable unit X for the purpose of program Y, i.e., summing across line item. Depending upon the order of the first two coordinates, there are a total of six different ways to display the information in this 2-dimensional fashion. They are:

(i) By accountable unit, and within that by line item (A by L)
(ii) By accountable unit, and within that by program (A by P)
(iii) By program, and within that by accountable unit (P by A)
(iv) By program, and within program by line item (P by L)
(v) By line item, and within line item by accountable unit (L by A)
(vi) By line item, and within line item by program (L by P).

Information provided by the above is very useful. Questions and inquiries such as, "What percentage (or how much) of the amount requested for line item X is for program Y?" which are often asked in budget hearings can be answered with ease.

3. 1-dimensional: This is the most aggregated way of displaying the budget. For one particular coordinate, the contents of the cells in the entire surface or cross-section of a specific subdivision of the coordinate are summed together, giving the total budgeted amount for that subdivision of the coordinate. In other words, the contents of all the cells with the specific part code of the coordinate are grouped together. This gives the amount budgeted for each accountable unit, for each program, and for each line item. Displaying the budget in this aggregation by line item is equivalent to the format of the tradition budget. Total program cost for every program as well as total operating cost of every accountable unit, is also available in this aggregation.

4. Subsystem: The three different ways of displaying the budget as discussed above may also be applicable to a certain portion of the entire budget, for instance, program X through program Y. This allows many other ways of looking at and analyzing the budget.

Figure 5 shows the first three ways of viewing the budget in diagram.

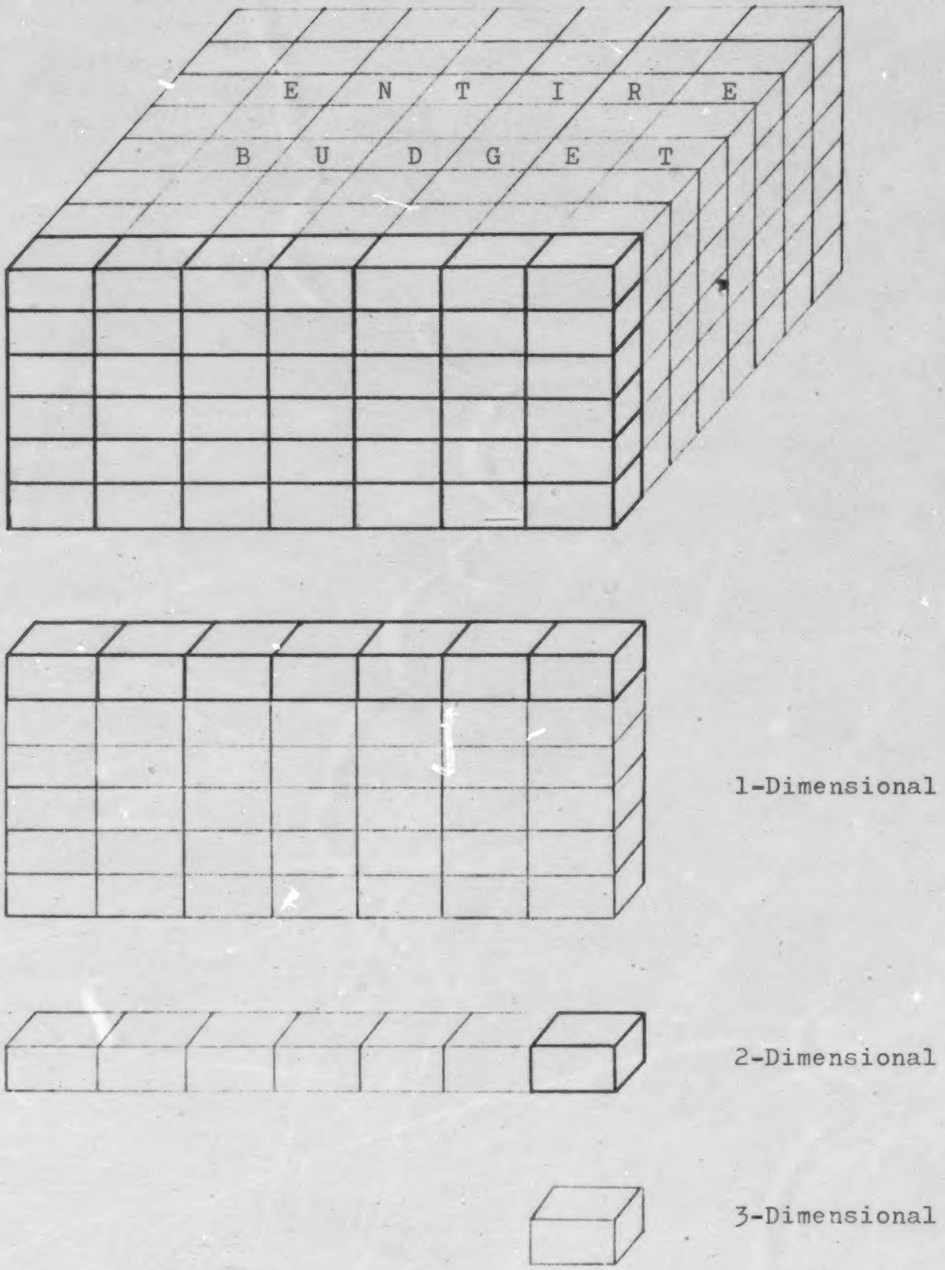
E N T I R E
B U D G E T
1-Dimensional
2-Dimensional
3-Dimensional

Figure 5. Ways of Viewing the APL Budget.*

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* Mathematically, the four parts correspond to a volume, a surface, a line and a point.

To promote comparability throughout the educational community, the National Center for Educational Statistics of the Office of Education has recommended eleven dimensions to be used by school district officials in recording financial transactions.* The dimensions are as follows, with the first seven termed as "imperative":*

1. Fund
2. Object
3. Function
4. Operational Unit
5. Program
6. Source of Funds
7. Fiscal Year
8. Instructional Organization
9. Assignment
10. Term
11. Special Cost Center.

The three-dimensional APL budget seems to be inadequate when first compared with the above. However, with the practice of fund accounting in most school systems, and by fiscal year, the first seven dimensions above are being taken care of.

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* National Center for Educational Statistics, Financial Accounting: Classifications and Standard Terminology for Local and State School Systems, Office of Education, DHEW, 1973, p.60-64.

3.3 PRESENT LEVEL VS NEW OR EXPANDED PROGRAM

In the process of preparing for a budget proposal or making a budget request, two kinds of future expenditures are encountered. Part of the budget, usually a major portion, is to support the programs at the present level; while the rest, usually a minor portion of the budget is intended for new or expanded programs, which exceed the present level of activities. Every budget is heavily influenced by past commitments.* As a result, when preparing a new budget, some items are "controllable" while others are "uncontrollable". An already negotiated teachers' contract calling for a certain percentage of across the board salary increase, an innovative school adding on the top grade, debt services, etc. are examples of the uncontrollable items. Quite similarly, the U.S. Congress, in some cases, has authorized programs for several years or has voted permanent budget authority, under which funds become available annually without further congressional action.

On the other hand, the addition of a new counselling program, the initiation of a student newspaper, the installation of a new piece of equipment which the school district did not have before,** etc. are referred to as new or expanded programs, which often require additional budget request on top of the necessary resources to maintain the present level programs.

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* Office of Management and Budget, The United States Budget in Brief, 1975, U.S. Government Printing Office, p.8.

** Replacement of worn out equipment is considered to be present level.

By separating these two different kinds of budget requests, the formulation, review and planning of the budget can be carried out with more clarity and perhaps more rationality. By doing so, it also helps in the programming phase and in the selection among a series of new or expanded programs.

During the budget proposal stage, the entire APL budget is assembled and displayed in the different formats by

1. present level programs only,
2. new or expanded programs only, and
3. all programs together.

After the budget is approved and adopted, only the total budget in its entirety need to be kept.

CHAPTER 4

IMPLEMENTATION OF APL BUDGET AT CAMBRIDGE SCHOOL DEPARTMENT

4.1 INTRODUCTION

The APL Budget was conceptualized, initiated, developed and finally implemented at the Cambridge School Department in the State of Massachusetts. These took place from the fall of 1973 to the spring of 1974.* The APL budget was being used at the Cambridge School Department to prepare its entire general fund budget of $20.7 million for fiscal year 1975.**

The design and the implementation of the APL budgetary system were carried out by the Office of the Assistant Superintendent in Business, under the directives from the School Committee *** and the Superintendent of Schools, and with the cooperation and assistance of the other two assistant superintendents.

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* The accompanying computerized program accounting system was developed in April, May and June of 1974. Refer to Overview of a Computerized Program Accounting System, Cambridge School Department, June, 1974.

** A fiscal year is the accounting period for which funds are budgeted and made available for expenditure. In general, it covers the twelve months ending June 30 of that year. Hence, fiscal year 1975 means from July 1, 1974 to June 30, 1975.

*** School Committees are often referred to as School Boards in many other states.

Although federal fund and state fund are available at the Cambridge School Department, the general fund from the city of Cambridge constitutes the major portion of resources for all the operations of the school district. Federal fund supports or subsidies some specific projects or programs. State fund, often in the form of reimbursement or subsidy, (e.g. Chapter 766 for Special Education) is not available in advance. Therefore, attention was given to the formulation and preparation of the general fund budget. In regard to the three-dimensional APL budget, the addition of a fourth dimension for fund source can easily enable the inclusion of all funds. For brevity and clarity, this paper will only discuss the budget in 3-dimensions, that is, for general fund only.

This chapter will start out with a brief description of the setting at Cambridge School Department. After some elaboration on the APL budget structure, input documents to the budget and some sample display of the budget output will be given. At the end of the chapter, the entire budgetary process will be discussed step by step.

4.2 CAMBRIDGE SCHOOL DEPARTMENT

The Cambridge School District has two high schools (9-12)* and 16 elementary schools (k-8) including one alternative school (C.A.P.S.). Total enrollment for fall 1973 was 9,859.** Headed by the superintendent of schools, the executive administration of the School Department reports to a governing board called the School Committee of six elected members plus the mayor of Cambridge as chairman. As of 1973-74, chief administrators in the School Department comprised of three assistant superintendents, one in secondary education, one in elementary education and one in business, masters and principals for elementary schools, headmasters for secondary schools, and directors or coordinators for academic disciplines and support services.

Payroll of the School Department was processed by a contracted commercial bank together with other payrolls of the city. Payments and transactions for all expenditures were processed by the city treasurer although all paperwork was handled by the Business Office of the School Department, which also kept its own posting and encumbrances of all line item accounts according to the accounting practice of the city auditor's office.

The Cambridge School Department had one year of experience in the program budgeting aspect of PPBS prior to the implementation of the APL budget, which as mentioned before, bears the same concept but requires different budget input and output, and different budgetary pocesses and emphases.

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* The Pilot School and the Achievement School are schools within school.

** For further details regarding enrollment at the Cambridge School Department, refer to its Planning Reports I and II, January, 1974.

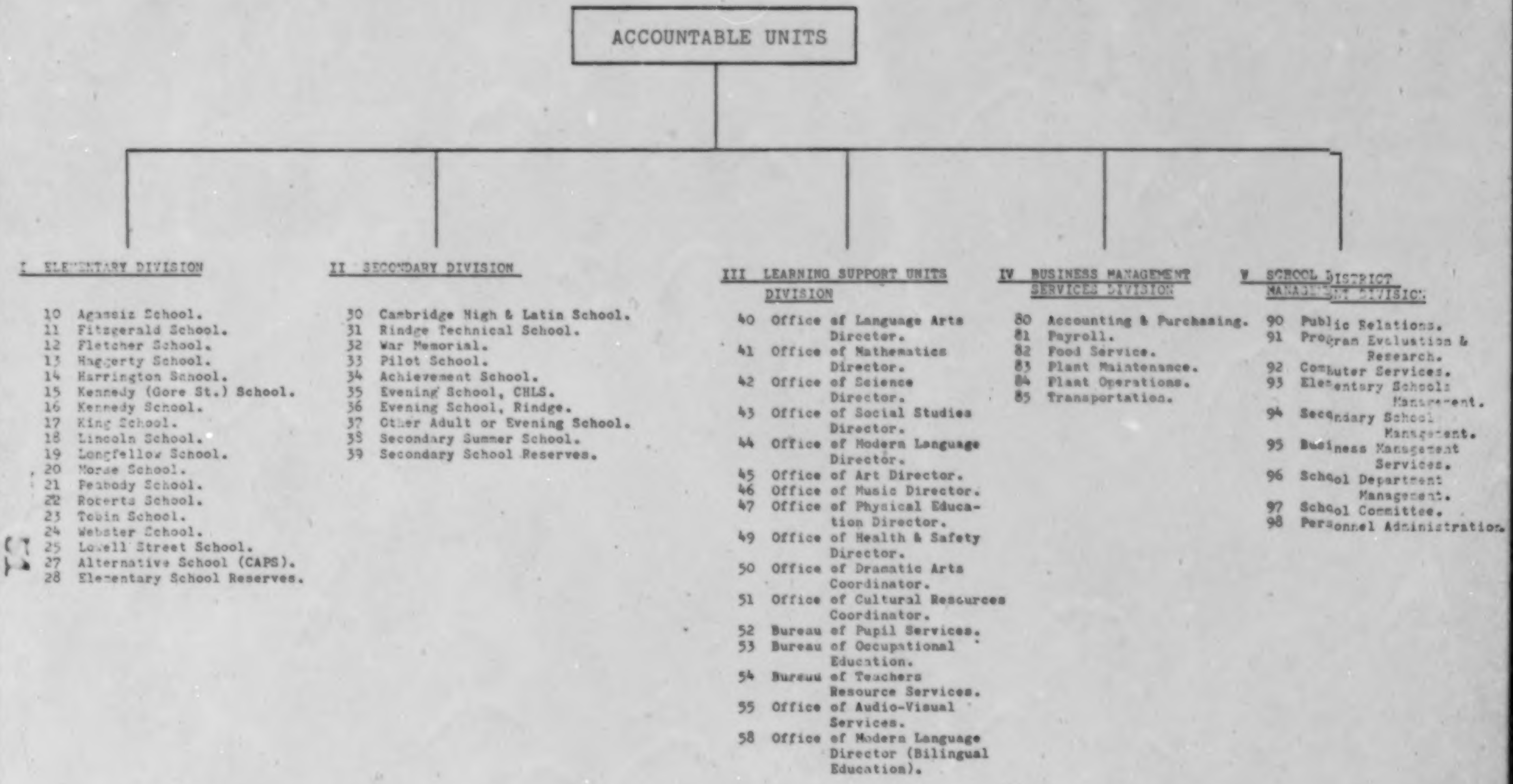
4.3 FIRST DIMENSION: ACCOUNTABLE UNIT

The development of a new chart of accounts which reflects the changes in the budget structure is a key task in the implementation. The chart of accounts lists, defines and explains all the elements in the three dimensions of the budget.

The structure of the accountable units of the Cambridge School Department is given in Figure 6 . It consists of five divisions, each of which has its own units. A two digit code is given to each accountable unit. The budget can be aggregated and displayed by accountable unit, as well as by accountable unit division. The five divisions are:

1. Elementary Schools Division (Codes 10 - 29)
2. Secondary Schools Division (Codes 30 - 39)
3. Learning Support Units Division (Codes 40 - 59)
4. Business Management Services Division (Codes 80 - 89) and
5. School District Management Division. (Codes 90 - 99)

The accountable units were carefully aligned in such a way in order not to disturb the present organizational structure as far as possible. The small functional subunits within the business office were emphatically treated as accountable units under the Business Management Services Division. This is important at the budgeting stage to budget those expenditures centrally, although later on in accounting, the expenditures may be accounted for by school or accountable unit. This enables more accurate central budgeting and control, and yet allows specific business management costs like plant maintenance to be decentrally accounted for each school and accountable unit.



ACCOUNTABLE UNITS

I ELEMENTARY DIVISION

10 Agassiz School.
11 Fitzgerald School.
12 Fletcher School.
13 Haggerty School.
14 Harrington School.
15 Kennedy (Gore St.) School.
16 Kennedy School.
17 King School.
18 Lincoln School.
19 Longfellow School.
20 Morse School.
21 Peabody School.
22 Roberts School.
23 Tobin School.
24 Webster School.
25 Lowell Street School.
27 Alternative School (CAPS).
28 Elementary School Reserves.

II SECONDARY DIVISION

30 Cambridge High & Latin School.
31 Rindge Technical School.
32 War Memorial.
33 Pilot School.
34 Achievement School.
35 Evening School, CHLS.
36 Evening School, Rindge.
37 Other Adult or Evening School.
38 Secondary Summer School.
39 Secondary School Reserves.

III LEARNING SUPPORT UNITS DIVISION

40 Office of Language Arts Directer.
41 Office of Mathematics Director.
42 Office of Science Director.
43 Office of Social Studies Director.
44 Office of Modern Language Director.
45 Office of Art Director.
46 Office of Music Director.
47 Office of Physical Education Director.
49 Office of Health & Safety Director.
50 Office of Dramatic Arts Coordinator.
51 Office of Cultural Resources Coordinator.
52 Bureau of Pupil Services.
53 Bureau of Occupational Education.
54 Bureau of Teachers Resource Services.
55 Office of Audio-Visual Services.
58 Office of Modern Language Director (Bilingual Education).

IV BUSINESS MANAGEMENT SERVICES DIVISION

80 Accounting & Purchasing.
81 Payroll.
82 Food Service.
83 Plant Maintenance.
84 Plant Operations.
85 Transportation.

V SCHOOL DISTRICT MANAGEMENT DIVISION

90 Public Relations.
91 Program Evaluation & Research.
92 Computer Services.
93 Elementary Schools Management.
94 Secondary School Management.
95 Business Management Services.
96 School Department Management.
97 School Committee.
98 Personnel Administration.

Figure 6. Accountable Units of Cambridge School Department, 1974-75.

Accountable unit 28 (Elementary School Reserves) and accountable unit 39 (Secondary School Reserves) warrant some explanation. These are not real organizational units. They are being set up to contain reserve expenditures and expenditures which are general in nature to all the schools. For instance, they contain funds set aside for emergencies, reserves for shifting population of students from school to school, and all of those expenditures designated by the discipline directors including such items as musical instruments, audio-visual equipment, athletic equipment, etc. which sometimes cannot uniquely be budgeted and attributed to one single school.

As an example of setting up all these responsibility centers, it may be apt to point out that the budget of the Federal Government is also formulated and displayed by agency* which is comparable to accountable unit being used here in the APL budget. The Department and other units used by the Federal budget are as follow:

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* Office of Management and Budget, The United States Budget in Brief, 1975, U.S. Government Printing Office, p.54, and U.S. Government Printing Office, The Budget of the United States Government, 1967, U.S. Government Printing Office, 1966, p.161-372

Legislative Branch.
The Judiciary
Executive Office of the President
Fund appropriated to the President
Agriculture
Commerce
Defense -- Military
Defense -- Civil
Health, Education, and Welfare
Housing and Urban Development
Interior
Justice
Labor
State
Transportation
Treasury
Atomic Energy Commission
Environmental Protection Agency
General Services Administration
National Aeronautics and Space Administration
Veterans Administration
Other Independent Agencies
Allowances
Undistributed Intragovernment Transaction.

4.4 SECOND DIMENSION: PROGRAM

Many authors have devoted some thorough discussion on the design of program structure, for example, Taylor (Hinrichs and Taylor, 1969, p.32-47), Gulko (1972) and Haggart (1971). Many different schemes and heirarchies have been used and proposed. NCHEMS uses six levels in designing the program structure for higher education in order to provide alternative aggregation levels and multidimensional classifications for analytical purposes. The six levels are:

1. Program
2. Subprogram
3. Program Category
4. Program Subcategory
5. Program Sector
6. Program Element.

The more general program structure, however, may be reflected by the directive contained in Bulletin 66-3, issued by the U.S. Bureau of the Budget regarding the development of such categories: (Hinrichs and Taylor, 1969, p.32-33)

1. Program categories: are groupings of agency programs (or activities, or operations) which serve the same broad objective (or mission) or which have generally similar objectives.

2. Program subcategories: are subdivisions which should be established within each program category, combining agency programs (or activities or operations) on the basis of narrower objectives contributing directly to the broad objectives for the program category as a whole.

3. Program elements: are usually subdivisions of program subcategories and comprise the specific products (i.e. the goods and services) that contribute to the agency's objectives.

Haggart (1971) and others suggested a program structure by what is to be learned. In other words, the structure is objective-oriented and carries such major programs as "Learning Intellectual Skills", "Learning About the World", "Developing the Individual", "Preparation for Employment", "Preparation for Higher Education", etc.

The program structure proposed to be used by the Cambridge School Department APL budget (Figure 7) was more activity-oriented, and could be most closely described as based upon "grade-level and curricular subject-matter organization." (Hartley, 1968, p.161-165) Such a hybrid format combines grade level organization at the lower grades of elementary level, with subject matter organization at the secondary level and at the higher grades of elementary level. This represented the efforts in trying to segregate by subject matter as realistically operational as possible within the present instructional organization. The existence of Program 112 (Basic Skills, Grades 1-3) and Program 120 (Science, Grades K-8) and others reflected partially the organization of the elementary school and the assignment of teaching personnel within the School Department. The organizational lines were still tactfully maintained in the program structure for easier budgeting and accounting, in spite of what Hartley (1968, p.165) had pointed out that "inasmuch as a program will cut across departmental lines, the notion of departmentalization may inhibit systems (or programmatic) thinking."

PROGRAMS

I ELEMENTARY EDUCATION

110 Kindergarten.
112 Basic Skills, 1-3.
114 Basic Skills, 4-6.
116 Language Arts, 7-8.
118 Mathematics, 7-8.
120 Science, K-8.
122 Social Studies, 7-8.
124 Modern Languages, 4-8.
126 Physical Education.
128 Art.
129 Dramatic Arts.
130 Music.
131 Cultural Resources.
132 Bilingual-ESL Education.
134 Occupational Education (Home Economics).
136 Occupational Education (Shop).
137 Health & Safety Education.
138 Remedial Reading.
140 Counselling.
142 Library.
144 Athletics.
146 Follow Through Program.
148 General Instructional Support.
150 Elementary School Management & Supervision.

II SECONDARY EDUCATION

210 Language Arts.
212 Mathematics.
214 Science.
216 Social Studies.
218 Modern Languages.
220 Occupational Education (Business Education).
222 Art.
224 Music.
226 Physical Education.
228 Bilingual-ESL Education.
230 Occupational Education (Home Economics).
232 Occupational Education (Industrial Arts).
234 Health & Safety.
236 Driver Education.
238 Dramatic Arts.
239 Cultural Resources.
240 Athletics.
242 Counselling & Guidance.
244 Library.
246 Student Activities.
248 Occupation Education (Work-Study).
250 General Instruction Support.
252 Secondary School Management & Supervision.

III SPECIAL EDUCATION & PUPIL SERVICE PROGRAMS

310 Home Instruction Program.
315 Hearing Program.
320 Speech Program.
325 Emotional Disturbed Program.
330 Perceptually Handicapped Program.
335 Physically Handicapped Program.
340 Multiple Handicapped Program.
345 Trainable Mentally Retarded Program.
350 Educable Mentally Retarded Program.
355 Central Medical Services.
360 Central Mental Health Services.
365 Central Counselling & Guidance Services.
370 Central Attendance Services.
375 Pupil Services Management.
380 Special Need Resource Center.

IV SUMMER SCHOOL PROGRAMS

410 English.
415 Mathematics.
420 Science.
425 Social Studies.
430 Bilingual-ESL.
435 Modern Languages.
440 Occupational Education (Business Education).
450 Driver Education.
455 Art.
460 Drama.
465 Summer School Management.

V ADULT & CONTINUING EDUCATION

510 Adult Basic Education.
520 Adult Civic Education.
530 C.H.L.S. Evening School.
540 Rindge Evening School.

VI LEARNING SUPPORT PROGRAMS

610 Audio-Visual Program.
620 Curriculum Supervision & Development.
630 Teachers Resource Center.
640 School Volunteer Program.
650 Occupational Education.

VII BUSINESS MANAGEMENT SERVICES PROGRAMS

710 Accounting & Purchasing.
720 Payroll.
730 Food Service.
740 Plant Maintenance Program.
745 Plant Operations Program.
750 Transportation, Regular Buses.
755 Transportation, Taxi.
760 Transportation, MBTA Tickets.
765 Transportation, Field Trips.
770 Transportation, Swimming Program.
785 Supply Distribution.

VIII SCHOOL DISTRICT MANAGEMENT PROGRAMS

810 Public Relations.
820 Program Evaluation & Research.
830 Computer Services.
835 Personnel Administration.
840 Elementary Schools Management.
850 Secondary Schools Management.
855 Adult & Continuing Education Management.
860 Business Management Services.
870 School Department Management.
880 School Committee.

Figure 7. Programs of Cambridge School Department, 1974-75.

The program structure has 2 levels, program areas and programs. It has eight program areas, each of which is subdivided into programs. A unique three-digit code is assigned to each program. Programs in the same program area have the same first digit. The budget can be aggregated and displayed by program area. The eight program areas are:

1. Elementary Education (Codes 100's)
2. Secondary Education (Codes 200's)
3. Special Education and Pupil Services (Codes 300's)
4. Summer School Programs (Codes 400's)
5. Adult and Continuing Education (Codes 500's)
6. Learning Support Programs (Codes 600's)
7. Business Management Services (Codes 700's)
8. School District Management (Codes 800's)

4.5 THIRD DIMENSION: LINE ITEM

In this paper the term line item is being used interchangeably with the term object class, which is a grouping of like goods, services or personnel resources needed in carrying out activities and programs, generally with the categories of salaries, services, supplies, equipment, and other expenses.

The object-oriented budget is the simplest form, consisting of a list of objects of expense, such as salaries, supplies, equipment, contracted services, and so forth, without regard to their function. (Hartley, 1968, p.129) Many school districts have been using only line items for budgeting and accounting, as many city councils and governing boards are approving appropriations by line item. Hence, the object classes are being used for fiduciary and auditing purposes.

The original line item structure of the Cambridge School Department was reconstructed and modified in order to be in line with the usage of the APL budget concept. Figure 8 details the new line items used in the APL budget at the Cambridge School Department. There are five main categories, which conform to the accounting requirements of the City of Cambridge:

1. Salaries,
2. Contracted Services,
3. Supplies and Materials,
4. Revolving and Special Fund, and
5. Equipment.

LINE ITEMS (OBJECTS)

A SALARIES

A01	Permanent Salaries.
A02	Temporary & Over-time Salaries.

B CONTRACTED & OTHER SERVICES

B01	Printing & Binding.
B02	Postage.
B03	Advertising.
B04	Travel in City.
B05	Cartage & Freight.
B06	Rental of Equipment.
B08	Light & Power.
B10	Rental of Buildings.
B11	Insurance of Vehicles.
B13	Communications.
B14	Motor Vehicle Repair.
B18	Cleaning Services.
B22	Medical Services.
B31	Extermination Services.
B39	Other Services.
B42	Graduation Services.
B43	Travel in State.
B44	Travel Outside the State.
B75	Contract Negotiating Services.
B76	Payroll Processing Services.
B77	Artists-in-Residence.
B80	Testing Services.
B81	Transportation of Students.
B82	Contracted Instruction (Workshop).
B83	Teacher Stipends (Workshop).
B84	School Volunteers.
B85	Clothing Allowance.
B87	Consulting Services (Administrative).
B88	Tuition to Other Schools.
B89	Data Processing Services.
B90	Rental of A/V Materials.
B91	Mental Health Services.
B93	Equipment Maintenance (Instructional).
B94	Equipment Maintenance(Non-Instructional
B95	School Plant Maintenance.

D SUPPLIES & MATERIALS

D01	Central Office Supplies.
D02	Food Supplies.
D03	Fuel.
D06	Library Materials.
D08	Maintenance Supplies.
D09	Educational Supplies (Warehouse).
D11	Gasoline & Oil.
D13	Chemicals.
D16	Other Supplies.
D18	Textbooks.
D19	Library Books.
D23	Instructional Materials.
D80	Lumber Supplies.
D83	Custodial Supplies.
D86	Periodicals & Newspapers.

F SPECIAL FUND

F80	Food Services Revolving Fund.
F81	Salary Increases.

G EQUIPMENT

G04	Motor Vehicles.
G07	School Furniture (Instructional).
G08	Educational Equipment (A/V Included).
G09	Furniture & Equipment (Non-Instructional).

Figure 8. Line Items (Objects) of Cambridge School Department, 1974-75.

4.6 SALARY DISTRIBUTION AND PROJECTION

Salaries for personal services at a school district usually accounts for a very substantial portion of the budget. At the Cambridge School Department, salaries represented 80% of the fiscal 1975 budget for general fund. Accurate projection of salaries will help the formulation of the budget tremendously.

One way of estimating the salaries requirement may be as follow: For each school or unit, multiply the number of teachers required for that school or unit expressed in full-time-equivalent (FTE) by the mean salary figure of the teachers in that school or unit. Custodians and paraprofessionals (e.g. teacher aides) may be calculated in the same way by group or otherwise the total for the entire system may be lumped together in the estimation.

However, in order to be able to distribute the salaries to the appropriate programs and accountable units, a different approach was taken at the Cambridge School Department for the APL budget. All employees, from the superintendent of schools through teachers to custodians, were first coded into the accountable unit(s) and program(s) with which they were associated. For those who were involved in more than one program or more than one accountable unit, they were coded as such with the correct proportion of time expressed in terms of full-time-equivalent. As an example, a teacher who taught Mathematics and Driver Education in Rindge and in CHLS devoting approximately equal amount of time in each subject in each school was being "split" up into four equal parts:

FTE	Accountable Unit	Program	Line Item
.25	30	212	A01
.25	30	236	A01
.25	31	212	A01
.25	31	236	A01

Depending on the kind of assignment of the employees, much more complicated kinds of "splits" were possible and encountered. Based on the student enrollment projection and the School Committee's future policy, the teachers were scheduled accordingly.

After the coding of the employees into their appropriate account units and programs had been accomplished, their current steps, anticipated increments, raises, salary scales and other relevant information were collected and fed into the computer. A package of computer programs was developed to automatically assemble all information and print out the salary projection by accountable unit and by program. The increments were being sorted out and printed under separate headings. This provided the top administrators with information regarding the factors underlying the increments. It helped to identify, say, the amount of money required by the 3% across-the-board salary increase as well as the cost-of-living adjustment clause dictated by the teachers' contract. This package can also be utilized to simulate possible financial impact by some hypothetical policy and decision modification, for instance, what will be the financial liability of the School Department if the salaries of some particular groups of teachers were increased by a certain percentage, or how much money would have been saved by delaying a certain raise for the clerical staff by three months.

A sample output is given in Figure 9 for the teachers payroll.*

Such a salary distribution by accountable unit and program not only helped in the projection of salary but also would be of utmost utility when analysing the cost of individual programs and their effectiveness.

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* Separate listings and projections were made for the five main payrolls: teachers/professionals, teacher aids, clerical staff, custodial staff, and food service staff.

```
ACCOUNTABLE UNIT 17 - KING SCHOOL

       1             2     3     4      5     6    7     8     9   10  11      12    13     14     15      16

                  PAYROLL        PRO- POS.  STEP/ BASE STEP/ BASE INCR  ON TOTAL INCR INCR   INCR   TOTAL
      NAME         CODE    FTE  GRAM DEG.  RATIO SAL. RATIO SAL.  DUE        SAL   DUE  DUE    DUE    SAL    TOTAL
                                     CODE   73-9  73   74-9  74   DEGR   LV 73-4  STEP 3PCT   ADJ.   74-5   INCR

  FORTUNA PHYLLIS  2376  0.60  325    2      1   9954.  2 10615.  0. 0  5972. 180.  150.    0.   6302.   330.
  JOHNSON JONELL   3385  1.00  325    2      3  10675.  4 11604.  0. 0 10675. 500.  274.    0.  11449.   774.
                         ---------------------------------------------------------------------------------
                         1.60                                          16647.      424.          17752.
                                                           0.               680.          0.             1104.
                         ---------------------------------------------------------------------------------

  HOWELL CAROL     3199  0.50  330    2      1   9954.  2 10615.  0. 0  4977. 150.  125.    0.   5252.   275.
  JOHNSON GEORGE   3383  1.00  330    2      2  10314.  3 10986.  0. 0 10314. 300.  259.    0.  10874.   560.
  GAYNOR CLARENCE  2492  0.10  330    1      3   9851.  4 10756.  0. 0   985.  50.   25.    0.   1060.    75.
  LO-PRESTI JOSEP  3991  1.00  330    1      3   9851.  4 10756.  0. 0  9851. 500.  254.    0.  10605.   754.
                         ---------------------------------------------------------------------------------
                         2.60                                          26127.      664.          27792.
                                                           0.              1000.          0.             1665.
                         ---------------------------------------------------------------------------------

  BOYCE PAMELA      529  1.00  350   41      5  11568.  6 12523.  0. 0 11568. 500.  295.    0.  12363.   795.
  CLARKE JOHN M    1000  1.00  350   44     11  17952. 11 18475.  0. 0 17952.   0.  435.    0.  18337.   435.
  DONNELLY MARGAR  1810  1.00  350   72     11  17231. 11 17733.  0. 0 17231.   0.  418.    0.  17649.   419.
  HOCKMAN RICHARD  3162  1.00  350   41      5  11568.  6 12523.  0. 0 11568. 500.  295.    0.  12363.   795.
  GILMAN ESTHER B  2600  1.00  350   41     11  15892. 11 16355.  0. 0 15892.   0.  385.    0.  16277.   385.
                         ---------------------------------------------------------------------------------
                         5.00                                          74211.     1931.          77042.
                                                           0.              1000.          0.             2831.
                         ---------------------------------------------------------------------------------

  -----------------------------------------------------------------------------------------------------------
  TOTAL                 41.39                                         546867.    13704.         575200.
                                                         103.             14524.          0.            21332.
  -----------------------------------------------------------------------------------------------------------
```

Figure 9. Sample Output of Salary Projection,

Cambridge School Department, 1974-75.

4.7 BUDGET FORMS AND DOCUMENTATION

Farmer (1970, p.20) pointed out that "the components of PPBS include an organization, the technology, some data processing service, and an organization policy of implementation." The importance of some data processing service in PPBS should not be overlooked. The massive scale of data required to provide useful information in a PPBS necessitates the assistance of the computer.

In order to be able to display and analyse the APL budget as discussed in the previous chapter, all budget request and appropriation need to be processed by the computer, without which, most of the budget reports could not have been produced on time. At the time the APL budget was developed at the Cambridge School Department, it had an IBM 1130 computer system, with 8K core memory, one single dis drive, an input card reader and a line-printer. It was put to use to process the budget data and generate all the reports. Owing to the limitation of its core memory and the speed of the printer, some restrictions were imposed on the system design. Other problems related to the hardware were either solved or bypassed by other means.

Assembling budget requests from responsible units, totalling the requested amounts, making adjustments and revisions, storing the back-up budget documents, and preparing other budget documentation for board review and public hearing all require a great deal of effort. Systematic forms will not only help to alleviate some manual record-keeping problems, but will also facilitate the input of budget data into the computer.

A total of eleven different forms were designed for the Cambridge School Department to accompany the preparation of the APL budget. The forms are numbered, printed on legal size (8½" x 14") card stock in different colors, and relevant information was preprinted with program codes and line item codes. They may be used to record information for present level and new or expanded programs, since a block was provided on each form to indicate as such. The forms are shown in Appendix B. A list of them follows:

Form #	Color	Name of Form	Purpose
200	blue	program summary	For managers and directors of programs to document program description, progress of program, and goals and objectives for the next fiscal year.
210	blue	Budget request, blank	A blank budget request form for miscellaneous budget requests and usage.
211	pink	Budget request for Elementary Division	For the masters and principals of accountable units in the elementary division to make budget requests. Relevant programs and line items are preprinted.
212	tan	Budget request for Secondary Division	For the headmasters of accountable units in the secondary division to make budget requests. Relevant program codes and line item codes are preprinted.
213	salmon	Budget request for Special Education	To record budget requests for special education for every involved accountable unit. Relevant programs and line item codes are preprinted.

Form #	Color	Name of Form	Purpose
214	yellow	Budget request for Director's Office	For the directors of academic programs to make budget requests for their offices.
220	salmon	Supporting detail for Temporary/ Overtime salaries (A-2)	For providing the supporting detail of all temporary/ overtime salaries, including purpose, computation rate, estimated expenditure for current fiscal year and requested budget for coming fiscal year.
221	white	Supporting detail for Contracted Services (B-item)	For providing the supporting detail of all contracted services requested.
222	tan	Supporting detail for Equipment (G-items)	For providing the supporting detail of all requested equipment, including the name of the item requested, its purpose, its estimated unit cost, trade in value, net cost, estimated current expenditure, quantity of the item requested and whether they are new or replacement.
223	beige	Supporting detail for Positions (A-1)	For providing the supporting detail of all requested positions in each accountable unit, including the title of the position, the program of the position, and the number of personnel in such program currently and proposed.
224	orange	Personnel work sheet	A worksheet for recording the current and proposed raw personnel student ratio.

In order to reduce one extra step of coding the budget requests to be keypunched, the input budget forms were set up in such a way that all requested budget amounts may be keypunched directly from the forms. The necessary three-part account numbers, the requested amount, and whether the request is a present level or new or expanded program are all readily available on the forms.* Forms and procedures play important roles in the implementation of a new budgetary system with a new budget format.

The forms discussed above thus served the following purposes:

1. as working documents for masters, directors and administrators to prepare budget, outlining program objectives, goals, etc.

2. internally as budget documents for record purpose,

3. as source input to the computer for budget summation and reporting.

4. as starting point for budget review, and

5. providing supporting and further detail for specific budget request.

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* Form 211, for instance, is filled out by accountable unit, and the form itself is two-dimensional, with program codes on the left-hand side and the line item codes across on top. Keypunching will involve the three-part account number and its budgeted dollar amount.

4.8 OUTPUT FORMATS

One of the main features of the APL budget formulation is its flexibility and versatility in its display. In other words, the budget itself may be viewed at from many different angles and the budget may be summed and aggregated in many different ways. The need to be able to look at the budget from many different dimensions arises from the fact that information provided in these ways will assist decision makers in their understanding of the entire budget and the financial interrelationship among the accountable units, programs and line items. Hence, comparison in many facets will be possible, for instance, by program or by accountable unit alone.

The many reports from the budget, in another application, also provide useful and necessary information for the justification of the budget request during budget review. Details of every request are broken down all the way to indicate the accountable unit, the program and the line item of every expenditure request. The ability to retrieve budget information instantaneously in many different groupings and ways of aggregation enhanced the utility of the budget. The top administration and the governing board have the opportunity of getting to know more about the budget and the interrelationship of the requested amount, since they are provided with more information concerning each amount.

As mentioned earlier, one of the features of the APL budget is its separation of present level programs and new or expanded programs during the course of budget formulation, proposal and review. This characteristic is being maintained in the output of the budget, by storing the requested amounts separately. All reports may be generated using the amounts budgeted for present level programs only, for new or expanded programs only, or for all programs.*

The entire budget was stored on disk. Changes to the budget proposal may be entered into the computer by keypunched cards and changes on the disk made. A transaction list showing the date and the detail of the changes was generated, thus providing a chronological documentation of the modification. Subsequent to any changes, part or all of the reports may be produced for further review. Since all the subtotalling and totalling of the budget were done automatically by the computer, very timely and accurate budget proposal information is available subsequent to changes. This fast turn-around time in assembling and displaying the budget affords the administration and the governing board to be kept abreast as soon as possible, of the current status of the budget proposed. Therefore, further modification to and the decision on the budget can be made with reference to the most current total picture. Without this assistance from the computer, minor changes to a budget generally result in many long hours of clerical arithmetic summation by row and by column in order to get a new total of the budget by dimension.

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* Codes 1,2 and 3 are respectively used in printing on the reports to indicate the three groups.

The following budget output from the computer are available for the three groups, namely, present level programs only (code 1), new or expanded programs only (code 2), and all programs (code 3):

Report A: Detail budget by accountable unit, within which by program, and within which by line item. Subtotal for each accountable unit is also given.

Report B: Budget by accountable unit division, by program areas, and by line item. The percentage of each budgeted amount in relation to the total is also given.

Report C: Budget by accountable unit division, within which the budget is displayed separately by program and by line item. Percentages of the amounts are given within each division.

Report D: The date and the detail of a budget revision, showing the detail account number, the old budgeted amount, the revised budgeted amount and the net change. A summary page reflecting the aggregated changes by line item is also generated. Since the City Council of Cambridge and the School Committee appropriate the budget by line item, special attention is given to the budget by line item.

Report E: Budget summary by accountable unit, by program, and by line item. Subtotals for accountable unit divisions, program areas, and line item categories as well as percentages for all listed amounts are also available on display in the report.

Report X: Budget by one of the three dimensions, and within which by a second dimension. Since the budget is in three dimensions, there are six different possible combinations in the report. Using A for accountable units, P for programs and L for line items, the six reports are: A by L, A by P, L by A, L by P, P by A, and P by L.

Sample reports from the computer are included in Appendix C.

4.9 BUDGET PROCEDURE

A description of the APL budget would not be complete without some brief elaboration on the budget process and the procedure of implementation. Attempting to discretize and sequence the steps involved in such an undertaking is difficult and not the purpose of this paper. As mentioned previously, there is no ideal or standard budget process. The implementation of a new budgetary system is not a simple task to take. Describing the process in the most general way with reference to the Cambridge School Department, the following steps may be also applicable to some other school districts contemplating the possibility of replicating the same procedures:*

Stage 1

1. Directives from top authority -- the School Committee.
2. Determine the emphasis, thrust, objectives and intended usage of the PPBS.
3. Determine the scope of change.
4. Determine the strategies and procedures of change.
5. Conduct internal feasibility study and internal examination.

Stage 2

6. Construct new program structure and new chart of accounts.
7. Internal reorganization if necessary.
8. Make sure the changes in the chart of accounts conform with the accounting requirements of the City.
9. Construct input forms and budget back-up documents.
10. Construct computer programs and packages for handling the input, output and update of the budget.
11. Design report from the computer.

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* For completeness, all steps are outlined to include a full budgetary cycle.

Stage 3

12. Code teachers and all employees into chart of accounts.
13. Salary/payroll projection.
14. Enrollment projection.
15. Revenue projection.
16. Determine allocation factors based on previous expenditures.*
17. Prepare instructions.
18. Set up budget packages.

Stage 4

19. Budget memorandum from the Superintendent of Schools.
20. Brief administrators** and principals regarding the processes and steps of the budget.
21. Assist the administrators in preparing the budget request and provide necessary data and information.

Stage 5

22. Principals and administrators discuss and plan with their own teachers and assistants.
23. Determine program objectives, goals and output indicators, etc.
24. Submission of budget request from principals and administrators.

Stage 6

25. Re-examine program objectives.
26. Re-examine and evaluate program.
27. Propose program alternatives.
28. Re-evaluate program alternatives.
29. Choose programs.

Stage 7

30. Assemble total budget.
31. Input budget proposal into computer.
32. Generate budget reports by computer.

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* Based on previous expenditures on supplies, textbooks, equipment, etc., allocation factors were determined to assist the preliminary distribution of budget request and to insure some extent of equity, e.g. textbook, $10/pupil; library supplies, $100/school plus 10¢/pupil. The principal of a school, however, may reallocate the resources for that school based on its individual needs within some given guidelines, e.g. textbooks may be reallocated ± 50%, printing and binding, ± 25%. This procedure gives the principal some latitude in reassigning the resources to meet the individual needs.

** Administrators to mean program managers and directors, etc.

Stage 8

33. Executive administrative review of budget.
34. Modify budget proposal.*
35. Update budget in computer and generate updated budget reports.
36. Prepare budget proposal documents.
37. Submission of preliminary budget proposal to School Committee.

Stage 9

38. School Committee reviews the budget.
39. School Committee conducts public hearings regarding the proposed budget.
40. School Committee modifies the budget proposal.
41. School Committee approves the budget.
42. Submission of budget to the City Council.

Stage 10

43. Appropriation approved by the City Council.
44. Expending the budget.**

Stage 11

45. Program accounting and control.
46. Modification of budget and reallocation of resources.
47. Financial reports and fiscal control.
48. Evaluation of programs.
49. Evaluation of output versus expenditure.
50. Analysis of program performance and effectiveness.
51. Start again from Stage 3 for next fiscal year.

The above steps grouped into stages are not meant to be complete or exhaustive. They simply serve the purpose of outlining some of the key procedures of the entire budgetary process when the new APL budget was designed and implemented at the Cambridge School Department.*** The next chapter will analyse some of the problems and difficulties encountered during the many stages of the new budget implementation.

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* The executive review and modification of the budget proposal may go through several cycles and be repeated several times.

** From this step on, it goes into a new fiscal year.

*** Several steps were added in order to present a more thorough discuss, although they had not been carried out at the Cambridge School Departmen

CHAPTER 5

ANALYSIS OF THE APL BUDGET

5.1 GENERAL

Incorporated with the benefits and advantages of every new budgetary system are some of its own problems. During the different stages of conceptualization, design, development and implementation of the APL budget at the Cambridge School Department, some problems and difficulties were encountered. Some had been solved or alleviated, but many could not. An analysis of some of these problems will not only lead to a further understanding of the APL budget, but will also help to clarify some of its limitations, as well as their remedies, if any.

The problems encompass a wide range of issues. An attempt to logically and systematically classify them by type did not prove to be very fruitful because some of them overlapped into more than one specific area while others were impossible to be labelled unambiguously.

Since the APL budget was conceived by and for the Business Office of the Cambridge School Department, the analysis and discussion that follows will inevitably carry an overtone of fiscal control in general and budget preparation in specific. The framework is more of a financial nature than anything else.

As will be clear in the following discussion, some related problems are unique to the Cambridge School Department, while others are general for the APL budget as a whole. Those that are unique to the Cambridge School Department are worth looking at more closely, as they may provide some insight and precaution for other school districts to prevent replicating the same situation.

The discussion that follows does not necessarily address "problems" per se, it is simply intended to direct attention pertaining to the areas of concern regarding the many facets of the APL budget.

5.2 ENROLLMENT PROJECTION

Inherited in every budgetary system of a school district is the need to come up with accurate enrollment projection. Although the APL budget is not entirely an enrollment-driven model, its ability to produce a viable budget does rely somewhat on enrollment. For instance, many formulas used for allocating textbooks, supplies, etc. depend on the projected enrollment. Enrollment projection were being made for every school by grade (Cambridge School Department, 1974a) and were used as a basis for calculating certain allocation. Inaccurate projection might result in uneven or insufficient resources.

This problem was partially handled by having two Reserves Accounts* in which some resources were budgeted to act as a cushion and to provide for emergency. This does not imply necessarily an extra amount to be requested, rather, a certain percentage of a certain line item (object) may be put aside into the Reserves Accounts first, before the rest are being distributed to the individual schools.

A major use of enrollment projection is to guide the staffing of teachers. The way the APL budget is formulated, it calls for the inclusion of the salary of a specific teacher in some program(s) of a school. In the case of special subjects, like music, physical education and others, the determination of teaching personnel requirement does not rely as heavily on enrollment by grade. However, to determine the number of homeroom teachers for elementary schools, both the enrollment by grade by school and the class size constraints governed by the teachers contract will have to be taken into consideration. Sometimes a decrease in enrollment in a particular school might not result in fewer teachers because it is the grade to grade composition that matters. A simple example will illustrate the point. Assuming that the teachers contract spells out the maximum class size in grade 4 as 25. Two classes of grade 4 with

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* Accountable Unit 28 is Elementary School Reserve and Accountable Unit 39 is Secondary School Reserve.

24 students in each of them call for two homeroom teachers, whereas a reduction of 14 students from the 48 will probably still require the staffing of two homeroom teachers in two classes of 17 students each. Although the Reserves Accounts might again help with the problem, yet the problem itself accompanies every budgetary system.

5.3 PROGRAM CLASSIFICATION

The difficulty in setting up clear program categorization stems partly from the way the organization is structured and partly from the inability to separate out unique and all-by-itself programs. As pointed out in Chapter 2, the program structure determines what programs and how programs may be evaluated and analyzed. From a program analysis standpoint, the finer the classification in the program structure, the more detail will be required for analysis. In order to avoid a great amount of redistribution of costs, especially the salary of teachers, the APL program structure had been designed to coincide with organizational lines. For instance, the lower grades in the elementary school were combined to form Basic Skills 1-3 and Basic Skills 4-6. This is also a recognition of the difficulty to accurately assess the percentage of time of, say, a first grade homeroom teacher devoted to social science. However, such a classification is not without its shortcomings. Some elementary schools have a K-1 combination, some are ungraded, and yet some are departmentalized from fourth grade and above. As a result, some teachers cannot be split up into their component parts for budgeting, without going through some kind of thorough analysis followed by some kind of judgement and arbitration. The most appropriate program structure for a school district is the one designed with the involvement of as many administrators and teachers as possible.

Since the program structure is used to accrue expenditures for accounting purposes and for later program analysis, its importance should not be overlooked.

5.4 DATA PROCESSING

Without making use of the computer, the enormous amount of clerical work required to output and display the APL budget in so many ways after each budget revision would have been prohibitive. However, with the limited computer resources at the Cambridge School Department, the design of the automated processing side of the budget is not without a certain amount of difficulty.

Consider the three-dimensional budget with its three coordinates. Although conceptually the budget is just like a big cube as discussed in Chapter 3, it would not be possible to store the accounts in the computer using a three-dimensional matrix. With 59 accountable units, 103 programs and 58 line items, the matrix would have a total of 59 x 103 x 58 = 352,466 cells, which would not be simple for the IBM 1130 computer with

8K core memory at the Cambridge School Department to handle. Since most of the cells in the matrix are empty, it would be a mere waste to create the huge matrix. To get around this, the accounts were stored linearly as three part numbers sorted in ascending order of accountable unit code, program code and line item code. Subsequent sorts into other sequences were done when required by the output reports.

Owing to the limited core memory, the titles for the program structure were stored on disk and were referenced just before the printing of a certain line. Consequently, for some reports (e.g. Report A,) the system is CPU-bound, although quite often it is I/O-bound due to the slow 80 lines per minute IBM 1132 printer.*

For the occasional modification on the proposed budget, reports were printed on 6-ply paper and enough copies for internal use were generated. It enables, for instance, the feeding into the computer the changes made during a public hearing and have the reports available the next day. In regard to the budget revision, care ought to be taken to ensure that the changes and decisions of administrators and governing board are made on the most current output, so that changes will not be made on some accounts which had already been modified.** This can present a problem when more than two decision makers were separately making changes on the same account without knowing what has been done to it.

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* The Cambridge School Department has since upgraded the printer to an IBM 1403 in June 1974.

** In order to maintain a whole picture of an account in relation to the entire budget, whenever an account is to be changed, the new total is entered to the computer, rather than just the adjustment of amount.

The other related functions of data processing, like keypunching, verifying and running the programs could also present problems if they are not controlled and coordinated properly. There is a minimum amount of keypunching required as far as input of the budget is concerned.

The FY 1974-1975 Preliminary Budget Request document (Cambridge School Department, 1974b) was printed several hundred copies by offset. Rather than using the entire 120 columns for printing reports, the output were formatted to print on a regular letter size page of 8½" by 11". This facilitates the reproduction of budget documents in quantity. Although this seems to be minute triviality, the usefulness and benefits of a budgetary system take into account small conveniences of this sort.

The small 8K core memory also imposed another restriction on the storage of the budget proposal. It was not easy, if not impossible, to keep all the historic changes and modification in the computer without going through some very complicated procedures. The administration's, especially the Business Office's desirability of an automated audit trail capability on all changes is understandable. With the then restriction of the hardware and the limited amount of time for computer programming, the problem was not resolved. It was settled with a report (Report D) showing the changes involved and the amounts before and after the changes for the accounts were made. Only the most current (latest) proposed amounts were stored in the computer disk. Although it was not able to generate the historic development of every account by the computer, with the assistance of Report D, the history of an account can be fairly easily compiled. This would serve the same purposes of an automated audit trail.

5.5 CENTRALIZED VS DECENTRALIZED BUDGETING

It was hard to determine what kind of items to be budgeted centrally or decentrally. This question requires the consideration of the present structure of fiscal control. For those items which the school principals were given autonomy, it is better to budget them in the individual accountable units. Whereas for those items which were controlled centrally, it might be appropriate to budget them as such. On the other hand, since unit cost and operating cost of a certain program in a certain accountable unit are of great interest to the administrators and decision makers, lumping them altogether centrally will lose the fineness of detail and hence also the ability to analyze the real full cost in a particular unit. Adding to all these complications,there are other kinds of expenditure which were difficult to budget by unit, especially the first year of preparing the APL budget when some necessary financial data are simply unavailable, or expremely tedious to come to any reasonable estimates. To circumvent this situation during the first year, many costs, e.g. building maintenance (B95 and D08), light and power (B08), telephone (B13), custodial supplies (D83), etc. were budgeted centrally. This also gives a more accurate estimate of the overall expenditure of the items. Later on, when the amount is being encumbered and expended, the transaction will be recorded in the program accounting system according to the actual spending accountable unit (Cambridge School Department, 1974d). Simultaneously, the expended amount will be deducted from the central account. Depending on the success of the accounting system, detail information will be used in subsequent years to more accurately determine the exact portion belonging to each accountable unit.

5.6 PRESENT LEVEL VS NEW OR EXPANDED PROGRAM

In order to provide more concrete and helpful information for making decisions regarding the funding of certain programs, a distinction between present level and new or expanded programs is necessary, as discussed in Chapter 3. However, in some cases it is not that straightforward to classify a certain item of expenditure as present level or new or expanded. To add a new program is clearly belonging to the latter kind of expenditure, while many others are not that obvious. This did not present too much of a problem because some kind of decision rule for the classification can be set up to take care of all those which are ambiguous. Sorting out the two kinds of expenditure helped the decision makers and plicy makers to select more appropriately when confronted with a normal situation in which there is not sufficient fund to cover all the proposed programs.

5.7 PERSONNEL TRAINING

Accompanied with the change of the budgetary system is the need to get the administrators to become familiar with it. This is a crucial step in the implementation of a new budgetary system like PPBS and APL. Since decision will be made based on the way the budget is assembled and displayed, a thorough understanding of the new budget structure and format and the interpretation of information is necessary in order to make full use of the system. Some kind of training sessions for the principals and directors will be most beneficial and valuable to the smooth and successful implementation of the budgetary process. At the Cambridge School Department this was done through seminars and training sessions at the Harvard Business School.

Besides exposing the administrators to the new formats and concepts, the accounting, bookkeeping and clerical staff at the school department need to be trained to handle the new forms and procedures also. This represent quite a task, since the financial accounting is an important part of providing necessary information for program analysis at a later stage. The unquestionabl importance for fiscal control also relies on accurate accounting practice.

5.8 BUDGET REPORTS

Budget information is of utmost importance for decision and policy making. The ability to provide budget information in many different ways is very desirable. The design and the automation of the APL budget allows a variety of formats by which the budget, as well as accounting information, may be easily aggregated and displayed.

However, the complexity of budget reports* requires some detail understanding on the part of the persons reading and examining them. The many different displays of the APL budget are designed to lay out some of the fine details of every budget item, in relationship to other accountable units, programs and line items. A solid understanding of the budget format and structure and how the reports are aggregated is necessary in order to be able to interpret the information provided by the reports and later on use the information for making decisions.

At the same time, the efficiency of the governing board's decision on the budget depends quite heavily upon the board members' thorough understanding of the budget structure, their accurate interpretation of the information, and their appropriate use of the budget documents. During the first year of the change over, it is inevitable for the board members to feel uncomfortable with the massive amount of information they are provided with as a result of the new system. The top administrators and the school board members will often find themselves suddenly being flooded with a huge amount of information, more than what they can handle and absorb in a limited amount of time. Such an issue will not happen again after the first year of implementation, when more experience has been gained with the APL format, and the decision makers will sure be more comfortable with it than in the very beginning.

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*Refer to Chapter 4.

At the conclusion of the APL budget approval at the Cambridge School Department, a member of the School Committee gave the following comments:

> "I believe we could have done a better job. The budget format is outstanding and provides us with more information in an organized and detailed manner that the Committee or public has ever before received. However, I would hope we might work more closely with the administration in the future to meet our responsibility to the children of the city and their parents."*

5.9 RESPONSIBILITY

With the way the APL budget was designed, it might be difficult to align properly a responsible administrator with an entire accountable unit or program depending on the organizational structure of the school district. It would be more desirable from a fiscal control standpoint to have a single administrator be responsible for all the accounts with the same accountable unit code.

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* In Cambridge Chronicle, March 14, 1974.

However, many organizational structure and the control patterns would not easily allow such simplification. In most of the cases, the master of a school is the manager responsible for that accountable unit. At the Cambridge School Department, for instance, the director or coordinator of a discipline (e.g. Science, Social Studies) is responsible for that program in all accountable units. Thus, not only that there are vertical lines of responsibility, some horizontal ones do exist and cut across accountable units.

One possible solution to this complexity is to add another dimension to indicate the responsible unit and to treat the present accountable unit dimension as location instead. By doing so, it will be able to accumulate cost and report budgets according to the location where the cost actually was spent as well as according to responsible unit. That is to say, the director of Mathematics, for instance, will be able to know precisely and in aggregate as to the budgetary and financial status of the funds which fall under his/her control. It ought to be pointed out, however, that such a move will not only modify the present organizational structure but might also involve a change in the pattern of decision making and control.

5.10 TIME CONSUMING

It has been widely accepted that PPBS requires a greater amount of effort in information gathering, reporting and analysis than conventional budgeting (Scurrah and Shani, 1974). The same is true with the APL budget. It goes without saying that as a result of such requirements, the preparation of the APL budget, the APL program accounting process, and the other necessary stages involved with the APL budgetary system constitute a very time consuming process, at least more so than before its implementation. Adequate staff, sufficient planning before the change over and enough time for the budget preparation and analysis are all important factors leading to the success of the new budget system.

5.11 ORGANIZATION

The lack of participation of school masters and program directors in the early design of a new budgetary system such as the APL budget is often not a very healthy indicator. Although there are justifiable reasons to develop a new budgetary system in a straightly top-down manner, it can be argued that some bottom-up involvement and contribution to the design might be of great help to the eventual goals of the new system. In the early phases of planning the APL budget, especially in the making up of program structure and definitions of program categories, the participation of administrators below the assistant superintendent level might have been of some help in developing a more viable structure. In the case of the Cambridge School Department, this was not quite feasible owing to the limited amount of time for the design and development of the new APL budget. The insufficient amount of time for the project had prevented the Cambridge School Department from doing so.

As another consequence of the lack of time is the inadequate emphasis placed upon the development of measurable goals and objectives, which although were completed by program directors in Form 200, were not critically reviewed, examined, challenged, or evaluated by top policy decision makers. This lack of quantifiable indicators will later on be reflected by the inability to perform a detail analysis and evaluation of the program progress and program cost-effectiveness, and hence might present insufficient information for the budgetary cycle of the following year.

Poor communication between teachers and masters, masters and program directors, and directors and top administrators may create some problems in the preparation of the APL budget, especially during the first year, when not all the small details about the procedures had been clearly specified. Good communication among the groups above will not only contribute greatly to the formulation of a budget, but will also ensure a smoother transition to the APL budgetary system than otherwise.

5.12 COST DISTRIBUTION

A major feature of the APL budget is the necessity and desirability of being able to identify every single item of expenditure uniquely with an accountable unit and a program that it is associated with. In the event that no such unique identification is feasible, the expenditure ought to be distributed appropriately and proportionally. This process often requires some judgement and arbitration, and inherited in this process naturally is a certain amount of inaccuracy.

The difficulties in isolating costs by accountable unit and program are recognized. No simple or comprehensive solution is being proposed. Aside from indirect overhead cost, some direct cost cannot be precisely distributed. For instance, students from one school attend some special classes in another; a school bus picks up students for several schools in one single run. Some measures and procedures will be necessary to adequately distribute the costs in some acceptable fashion, enabling simple budgeting, accounting and future analysis.

The overlap of fiscal expenditure in ordering and purchasing for accountable units and programs also makes cost budgeting and accounting difficult. It is not impossible though to alleviate such difficulty by simply imposing more paper work and documentation. Adding necessary codes on purchase orders enables the precise cost distribution (Cambridge School Department, 1974d). Even so, the system is not without its own share of problems.

5.13 PAYROLL BUDGETING

With salaries representing a substantial portion of a school district budget*,it is of great importance to project and budget all salaries to a certain acceptable level of accuracy. It was discussed in Chapter 4 about the way the payroll was estimated and budgeted. With the requirements of the APL budget, it is necessary to associate every individual with one or more accountable units and programs during the budget preparation. However, it can be seen that during the course of the actual spending, some adjustment will be required. It is very difficult, besides impractical, to estimate the outage** of each individual account. To determine the amount required for a certain account to pay for substitute teachers is just impossible, although for the entire system as a whole, the outage can be calculated based on historic data. To circumvent this problem of cushioning the outage for each individual account, some of which might have only one employee, the outage for the entire system is first calculated as before and prorated into the two Reserves Accounts*** as negative budget, hence balance out the unadjusted salary budget in each account. This negative budget in the Reserves Accounts will have to be redistributed through accounting procedures to the other accounts when it becomes necessary.

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* At Cambridge School Department, salaries represented 80.03% of the budget for fiscal year 1975.

** Outage is the adjustment to the payroll budget due to retirement, maternity leave, sick leave, late filling of vacant positions, etc.

*** Accountable unit 28, program 148 and accountable unit 39, program 250.

5.14 BUDGET PREPARATION

Because the APL budget requires such fine detail, it is difficult to capture 100% of the expenditure of a school district in the preliminary stage of budget proposal from masters and program managers. This is particularly true during the first year of change over to the new APL budget system, when responsibility for all items of expenditure has not been completely and clearly determined and documented. Hence, a few items of expenditure might have been left out in the budget since some administrators thought they were under the domain of others.

The reverse is also true. Sometimes, the cost of a certain expenditure might have been included in the proposal of more than one administrators. Therefore, to ascertain the inclusion of 100% of the budget in the proposal is as important as to avoid the double count of some items. Such precaution should be well taken.

This problem should have been pretty much taken care of by more careful planning, in terms of assigning all expenditure responsibilities before implementation of the new system during the first year. Further, this would not be much of a problem during the subsequent years, since the pattern of responsibility would have been known during the course of the year.

5.15 PAST EXPENDITURE

Generally, a budget for a certain fiscal year is prepared and approved a year or two in advance. This fact often causes some inaccuracy in estimating a budget. When preparing a budget for the coming year, the current fiscal year is still in progress and the actual expenditure for the current year is not available for consideration. It is true that partial information can be pulled together and through financial planning, project the expenditure for the rest of the fiscal year. What can be relied upon **are** the accounts of a year ago, since the books of that year would have been closed. However, this one or two-year gap in the budgeting/accounting information does lead to certain degree of inaccuracy in the future budget estimation based on past accounting.

At the Cambridge School Department, for instance, the budget proposal for fiscal year 1975 was prepared and compiled around December, 1973, and was acted on and approved in March, 1974. It is difficult to estimate with precision the necessary budget for the school district so much in advance. Most difficult of all is to estimate the salary requirement for the entire payroll. With the full time payroll budgeted at $15,267,624 a small inaccuracy of say 1% will mean a difference of $152,676, which is far more than the request for many non-salary items for most accountable units.

For the first year of the implementation of APL budget, the lack of last year's expenditure information in the APL format is also presenting some problem during the budget preparation stage. It is generally true that such information in the appropriate format is not always possible to get, since they were not being kept in the same way using the same structure. Depending on the previous chart of accounts and the accounting practice, it is sometimes possible to "crossover" the old accounts into the new format or structure. Such a crosswalk, however, is not necessarily always possible. At the Cambridge School Department, for instance, there was a line item G-9 labelled Rindge, which included many different kinds of expenditure items related to the Rindge Technical School. Hence, it was not easy to pinpoint it to a certain program or a certain line item. As is often done in many budgets, a single account is being "prorated" into several parts using some knowledgeable judgement, which again might not be accurate.

Without last year's accounting information in the new APL format, it did present some problem in trying to assemble next year's budget. For instance, it would be difficult to find out how much was spent in a certain line item for a certain program in a certain accountable unit, yet the decision as to how much ought to be budgeted for that same item next year hinges heavily upon some accurate information on that. However, it is believed that after the first year of implementation of APL budget, most of the information will become readily available. For the first year, the old line item total may be used as a checkpoint.

Many school budgets were prepared in a traditional line item fashion. After completion, the budget is then transformed into a program budget by means of a crosswalk. The APL budget is done in a slightly different way. The budget was prepared, assembled and displayed in the lowest level of detail, i.e. the lowest level of the three-dimensional concept. The traditional line item budget is available as a synthesis of the APL budget detail, hence, a crosswalk would not be necessary. This is one of the main features of the APL budget.

5.16 CROSSWALK

The lack of historic expenditure data in the APL format is an obstacle for a meaningful conversion to the new budgeting process. Previous information in expenditure for programs by line item, e.g. how much was spent for educational material for social studies in Longfellow School, or lumber supply for Industrial Arts, is not available and is usually quite difficult to estimate accurately depending on the kind of accounting practices in that school district.

At the Cambridge School Department, an attempt was made to recast the historical expenditure into the new APL budget with no success because many line items were not easy to recast without some detail analysis of each expenditure item in that account.

This inability to crosswalk from the old budget into the new budget format unfortunately leads to the loss of continuity and comparability. The second year of APL budget implementation will not present the same problem again.

5.17 PROGRAM ACCOUNTING

A good program budget must be enhanced and backed up by a complementary accounting system. A computerized program accounting system is of great importance for providing the great bulk of information required for budget preparation, evaluation and analysis. The complexity of the APL budget to a certain extent dictates the necessity of some sort of automated financial accounting and reporting. Yet such a computerized program accounting system is not simple to design. Basically it is comparable to a full fledge internal cost accounting system.

The same kind of difficulty in terms of identifying cost during the budgetary cycle is also repeated here during the accounting cycle. If the old line item accounting formats and procedures were followed, it would not be possible to generate financial reports for the programs or accountable units according to the structure with which they are budgeted, and thus lost the ability to carry out evaluation and analysis as an integral part of the PPBS. In order to be able to furnish all information associated with the APL budget, an automated accounting system tailored to the same design is necessary. This is to say, for example, that every expenditure item will be encumbered to a corresponding cell in the three-dimensional budget, rather than to the traditional object line item code.

The items which were budgeted centrally, have to be distributively accounted for when expended. At the Cambridge School Department, repair, maintenance, fuel and power, etc. are being budgeted individually in central accounts. However, for the purpose of obtaining more accurate operating cost, the expenditure for those items will be encumbered and posted according to each accountable unit. This decentralized accounting practice necessitates the backing out of the same amount from the original account at the end of every transaction posted by the computerized program accounting system. (Cambridge School Department, 1974d).

In order to distribute the accrued expenditure correctly and to the smallest detail unit, quite a few small routine procedures will have to be set up in order to be able to accurately pinpoint the expenditure to a certain specific account. A de-facto proration is often an acceptable although not necessarily the most desirable alternative. The approach taken by the Cambridge School Department is to rely as much on actual distribution as possible, only those items which present tremendous problem in trying to record the actual cost distribution will be prorated.

Minor modification in the ordering and purchasing procedures took place. All purchase orders and requests require valid 3-part account numbers which reflect existing accounts with positive balance. Inevitably, some extra paperwork had to be added. Manual ledger posting by line item was to continue, as necessitated by the City Auditor's accounting practice. However, the extra account codes on the purchase orders, the regular distribution of salaries for all payroll, and the other modified processes enabled the setting up of a computerized program accounting system to provide timely accounting information and financial reports similar in format to the budget reports.*

Some occasional adjustment had to be made to the two different accounting systems in order to resolve any discrepancy between them. This reconciliation might not be a simple task, yet it is of great importance.

This change of accounting system no doubt will also bring about modification of the bookkeeping system, reporting system, and control system, and will require the retraining of clerks and some revision of decision patterns of the school board members and the superintendents of schools.

5.18 SALARY DISTRIBUTION

The difficulty in coding teachers and other personnel into their appropriate accountable units and programs with the correct percentages of time is not to be taken lightly. Such a correct distribution of effort and salary is of essential importance both during the budgeting phase and later in the analysis and evaluation of the budget and program cost.

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*Besides the original budgeted amount, the following information for every detail account are also provided in the accounting financial reports: 1. amount of modified (working) budget, 2. current month expenditure, 3. fiscal year-to-date expenditure, 4. unexpended balance, and 5. percentage of unexpended balance.

The constant change of personnel and the reassignment of teachers add to the complexity of the task. The discrepancy between the program accounting of the detail salary distribution and the salary line item total will have to be resolved. The reconciliation might not be simple and entails much analysis and constant central maintenance of the whereabouts and efforts of all employees.

5.19 COMPATIBILITY

A change in the chart of accounts in a school district must be accompanied by some consideration concerning its compatibility with past and future accounting structure of the city and state government. The changes of line items at the Cambridge School Department had been carefully planned and in consultation with the City Auditor to ensure that they are consistent with the present and anticipated future requirements of the City. Such consideration will ensure the compatibility in accounting, reporting and auditing.

The number of digits used for the accountable units and programs was decided upon to be in line with the expected change of accounting and auditing structure to be implemented by the City of Cambridge some time later. Thus, the two digit code for accountable unit and the three digit code for programs are not according to the recommendation of the National Center for Educational Statistics (1973).

However, for reporting purpose, a simple table can be drawn up to relate each of the accounts in the APL budget to corresponding account(s) according to State and Federal financial reporting structure. Since the APL structure is in such fine detail, the information may be aggregated to satisfy most of the other governmental reporting requirements.

5.20 BUDGET & REVENUE PROJECTION

One characteristic of the PPBS which is different from the traditional line item budget is its inclusion of a multiyear budget projection. (Pyhrr, 1973, p. 142; Haggart, 1972, p. 46). Since resources are budgeted by program, it is quite natural to expect that multiyear projection for each program will be possible and of some use. Though necessary and important as it sounds, the projection into any period more than a couple of years will be liable to substantial margins of errors. The budget projection relies most heavily on three factors besides many others: 1. Enrollment, 2. Policy, and 3. Inflation, all three of which are not easy to project accurately in the first place. Only with an enrollment projection, an assumed inflation rate and a set of policy assumptions can the budget projection then be carried out.

The difficulty in revenue projection is also an area not to be overlooked. A school district budget depends to a certain extent upon its projected revenue, e.g. reimbursement, subsidies, aids and grants from State and Federal government. Often, it is not easy to estimate with confidence such revenue in a year or two in advance. The local city government might be reluctant to approve a school budget without a clear picture of the possible revenue, which, however, is difficult to project.

5.21 UNIT COST

Whereas a conventional line item budget is input oriented, it can be suggested that a program budget is output oriented. The notion of accountability relates to program output and program product. On top of other advantages, PPBS emphasizes on the cost--the unit cost by program. The calculation of unit cost is difficult for a school district where the unit of output has not yet been clearly defined and quantified. As a total system, the number of graduates from a certain school or just the number of students completing a certain grade may be taken as proxies for output. However, for a specific individual program, the unit of output is not that easily identifiable. The total cost of a program, both the direct and indirect cost, is even more difficult to calculate.

The APL budget proposes to keep the budgeting and accounting of all expenditure items in the smallest unit possible. Such detail format is intended to be able to isolate the real expenditures from one accountable unit to another and from one program to another. All direct costs thus can be accounted for any chosen unit of analysis, be it a program, a school, a program area or a division. Some indirect costs, like building maintenance, power and fuel, etc, will be distributed accurately to the smallest unit according to actual expenditure, even though they were budgeted centrally. Administrative overhead cost, on the other hand, can only be redistributed at the end of a fiscal year by some criteria or measures. Such proration using, say, the average number of students in a school, is inevitable, if a total cost is desired. The fine disaggregation of the financial data in the APL format allows most kinds of cost analysis. However, some provision will have to be made in regard to the calculation of debt services, capital investment, building costs, and the depreciation of capital equipment.

The criteria for evaluating program effectiveness were asked for on the budget request Form 200. Although not every objective can be quantified, the document does offer a starting point for any cost-benefit analysis of the program. It is therefore necessary to emphasize the importance of such information. If a substantial amount of effort has not been devoted in preparing such documents and in closely examining the goals internally, the APL budget, indeed any program budget, would have lost one of its main purposes. This part ties tightly with the planning, programming and evaluating phases of a budget cycle.

It is strongly suggested that some provision be made in advance as to how the cost effectiveness of a program can be evaluated prior to the actual approval and execution of the budget.

A close follow-up on the evaluation of goals and objectives of each program during the course of the fiscal year will be highly desirable, especially during the first couple of years in the implementation of the new budgetary system.

5.22 DECISION MAKING

There are important associations between decision making and PPBS. Farmer (1970, p. 8) pointed out that "planning and programming--a two step decision process--represent the substance of PPBS," while "budgeting is the mechanism for implementation and control, not for basic decision-making." PPBS affects the way decisions are being made, although it was never intended to be a decision-making device and it certainly is not. The most that it can do is to provide insights, to illuminate issues, to help identify relevant questions and thereby to make the choice problem a bit easier.(Petruschell, 1968, p. 15) The APL budget was designed to serve these purposes by providing an easy mechanism of collecting and displaying timely budget and financial information, which is an important part in the analysis of programs.

The main advantage claimed for the program budgeting process over that of the traditional budget is that "it is designed in relation to the decision process and helps to make it more effective by clearly defining alternatives among which choices must be made and by creating an information system that permits analytical appraisal of costs in relation to expected benefits." (Novick, 1969, p. 288)

APL budget is like the program budget which, according to Haggart (1970, p. 6) "...is, in part, a display device geared to organizing information in support of the decisionmaker."

Pyhrr (1973, p. 140) while comparing planning programming budgeting with zero-base budgeting noted that "PPB is aimed primarily at macroeconomic analyses of broad policy decisions and desired output rather than the nuts and bolts of detailed planning and implementation, and therefore related most directly to long range planning..." The APL design, however, provides detail financial information of every activity and allows some micro-level analysis of program effectiveness.

Along the same line, Haggart (1971, p. 3) pointed out that "...there is an emphasis on developing a program structure that is closely tied to the decisions to be made at different levels of decisionmaking..." and that "...the program structure should be designed to support the analytical aspect of PPB," otherwise "...the PPB effort will ... be just a new accounting system."

Although the APL was geared to "assist" in decision and policy making by providing an analytical framework in which decision makers can evaluate the goals and objectives and make meaningful decisions about the programs, it was fully aware that "most significant decisions are based on political judgements rather than analytical results." (Petruschell, 1968, p. 15) When a decision was made contrary to choice of an analytical result, the decision-maker is most likely "...influenced by factors not a part of analysis and it is his responsibility to be so influenced. However, the analysis did, at the very least, contribute to his awareness of some possible implications of his decision." (ibid)

5.23 APPLICABILITY TO OTHER SCHOOL DISTRICTS

The idea and the design of the APL budget [illegible] very basic and simple. The budget format itself is not complicated at all. The experiment at the Cambridge School Department can easily be transferred to any other small to medium size school districts. The input forms and the program structure may be used as a reference. Since the computerized budgeting and accounting system was designed in such a way that the titles of the accounts are external to the computer programs, the entire package can readily process the accounts of another school district with little or no modification. Hence, the APL budgeting and accounting reports can be applicable to other school districts.

CHAPTER 6

SUMMARY

6.1 RECAPITULATION

A new three-dimensional budget called APL budget has been developed and described in detail in the paper, illustrated with its implementation at Cambridge School Department. An analysis of the budget in terms of the problem areas during the preparation and formulation of the budget has also been presented.

6.2 FEATURES

Here are some of the main features of APL budget:

1. It is three-dimensional in format, consisted of accountable unit, program and line item.

2. Formulation of the budget starts with the smallest unit of the three-dimensional cube.

3. All budget items and accounting information are posted and maintained in the most disaggregated way.

4. Many different reports of the budgeting and accounting information may be generated by different ways and different levels of aggregation.

5. It has a fully computerized package to go with it, handling budget preparation, budget revision, budget reporting, program accounting, and financial reporting.

6. It provides much more budgetary information than the traditional line item budget alone.

7. More fiscal control may be exerted through the use of APL budget.

8. It enables flexibility in many aspects of the budgeting, accounting and reporting functions of a school district.

9. No crosswalk is necessary to display the budget in either the line item or program budget format.

10. It enables detail analysis of costs and assists in providing timely information for decision and policy making.

6.3 AREAS OF CONCERN

Some of the problem areas and difficulties in regard to the APL budget have been identified and discussed in the paper. They include:

1. The lack of historic expenditure data in the desired format to enable a meaningful conversion to the new budgeting process.

2. The difficulties in distributing personnel (teachers, for instance) into their corresponding accountable units and programs with the correct percentages of time or effort.

3. The usefulness and often lack of bottom-up participation during the planning of the new system and during the early stage of its implementation.

4. The difficulties in attempting to decentralize the budgeting of some of the expenditures, for instance, repair, maintenance, overhead administration, etc.

5. The inaccuracy and uncertainty of budget estimates and budget projections.

6. The complexity of budget reports and budget formats.

7. The necessity of staff training.

8. The difficulties in designing a complementary automated accounting system.

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APPENDIX A

GLOSSARY

Accountable Unit: A notion (term) being used to represent a combination of location (where programs take place or where programs are administered) and organizational unit (the entity which will be responsible and be held accountable for the funds budgeted within that accountable unit).

: This term is comparable, but not identical to "responsibility center."

: This term is also analogous to Principal Administrative Units (PAU) and Cost Control Centers (CCC) used in Planning Programming Budgeting Manual (Philadelphia School District, 1970).

Appropriation: An allocation of funds made by a governing authority for specified purposes and often restricted as to the time when it may be expended. (Hartley, 1968)

: An authorization to spend up to a specified dollar amount. (Horngren, 1972)

: An authorization granted by a board of education to incur obligations and make expenditures for a specific purpose. (Mitchell, 1964, p. 115)

Budget: A financial plan reflecting anticipated revenues and expenditures. (Philadelphia School District, 1970)

: A plan of action expressed in figures. (Horngren, 1972)

: A plan of financial operation embodying an estimate of proposed expenditures for a given period or purpose and the proposed means of financing them. (Mitchell, 1964, p.115)

Budgetary Process: Continuous activity comprised of planning, formulation of a budget document, interpretation, presentation to the approving authority, formal adoption, fiscal administration, and appraisal. (Hartley, 1968)

Budgeting: The financial implications of the various programs chosen from the set of alternatives. (Durstine and Howell, 1970, p. 8)

Cost Accounting:	A quantitative method that accumulates, classifies, summarises, and interprets cost and expenditure information for three major purposes, (1) operational planning and control, (2) special decisions and (3) product costing. (Horngren, 1972)
Cost Center:	The smallest unit of activity or area of responsibility for whcih costs are accumulated. (Horgren, 1972)
Crosswalk:	The expression of the relationship between the program structure and the appropriation-budget structure; the translation of multiyear program and financial plans into annual budgets; a simple table vertically listing program categories and horizontally listing appropriations and budget activities; based upon the program budget code. (Hartley, 1968)
:	The expression of the relationship between the program structure and the accounting structure. (Gulko, 1972, p. 112)
Direct Costs:	Salaries, fringe benefits, supplies, materials, equipment and services directly assigned to a program. (Chappaqua Public Schools, 1973)
:	Actual or budgetary costs that may be charged directly to, or prorated as a part of, the cost of a program, service, function, or department. They are eliminated if a program is eliminated or added if a program is added. (Hartley, 1968)
Encumbrances:	The term refers to recording against budget appropriations obligations when they are incurred and prior to expenditures being made for them. (Mitchell, 1964, p. 26)
:	Purchase orders, contracts, and salary or other commitments which are chargeable to an appropriation and for which a part of the appropriation is reserved. They cease to be encumbrances when actual expenditures for them are posted to the appropriation and the liability is set up. (Mitchell, 1964, p. 116)

Federal Funds: Funds made available through specific Congressional Acts of the Federal Government. The use of these funds is restricted to those purposes described in the act governing the particular fund. (Philadelphia School District, 1970)

Fiscal Year: A fiscal year is the accounting period for which funds are budgeted and made available for expenditure. A fiscal year is generally the year preceding June 30. For instance, Fiscal Year 1975 means July 1, 1974 to June 30, 1975.

Fund: A fund represents certain identifiable resources available to the School District. Each fund is authorized for specific purposes and its resources cannot be expended legally for any other ends. Each fund is an independent accounting entity. (Philadelphia School District, 1970)

: A sum of money, or other resource, set aside for the purpose of carrying on specific activities, or attaining certain objectives, in accordance with the special regulations, restrictions, or limitations stated in the education laws of the state. (Mitchell, 1964, p. 15)

General Fund: The largest of the School District's funds and is used to finance its day-to-day operations. The sources of revenues supporting this fund are local taxes, State subsidies, and non-earmarked Federal contributions. (Philadelphia, 1970)

Indirect Costs: Actual or budgetary costs that are not readily identified with a specific program, service, function, or department and that are seldom completely eliminated if a program is eliminated. (Hartley, 1968)

Invoice: An itemized statement of services rendered or of merchandise sent or shipped to the district with quantity, value or prices, and charges annexed. (Mitchell, 1964, p. 117)

Line Item: Same as object classes.

Object Classes: An object class is a grouping of like goods, services or personnel resources needed in carrying out activities and programs. (Philadelphia School District, 1970)

Objectives: Goals or results that the decision maker seeks to attain; hence, the end product or output of a program. (Gulko, 1972, p. 117)

Planning: Relating means to ends; formulating rationally feasible courses of action through a systematic consideration of alternatives; planning may be unilateral or participatory in nature; it also applies to settings where objectives and ends are not predetermined. (Hartley, 1968)

: The determination of what the organization wants to accomplish--its immediate and long-range goals or objectives as defined within available resources. (Durstine and Howell, 1970, p. 8)

: Selecting objectives and the means for their attainment. (Horngren, 1972)

PPBS: A conceptual approach to decision; a structured procedure for policy determination; emphasizes outputs, program activities, and accomplishments; long-range planning, analytic evaluative tools, and economic rationality are basic ingredients. (Hartley, 1968, p. 256)

: A management system involving the selection or identification of the overall, long-range objectives of the organization and the systematic analysis of various courses of action in terms of relative costs and benefits (planning); deciding on specific courses of action to be followed in carrying out planning decisions (programming); and translating planning and programming decisions into specific financial plans (budgeting). (Gulko, 1972, p. 119)

Program: A program is a set of related activities which embodies or expresses one or more major goals of the School District. A program may be instructional, or non-instructional. (Philadelphia School District, 1970)

: Any field of study or activity engaged in by the students of a school district. (FitzSimmons, 1966, p. 5)

: A group of interdependent, closely related services or activities possessing, or contributing to, a common objective or set of allied objectives; a package of subprogram, elements, components, tasks, and activities. (Hartley, 1968)

: The collection of program elements serving a common set of objectives that reflect the major institutional missions and related support objectives. (Gulko, 1972, p. 120)

Program Budget: A budget that identifies costs by program areas rather than the traditional state-prescribed categories of salaries, supplies, equipment, and other expenses. (Chappaqua Public Schools, 1973)

: Sum of the anticipated costs, both direct and indirect, of the various proposed programs. (FitzSimmons, 1966, p.5)

: A display of the expenditure consequences, over time, of activities resulting from current policies and decisions. (Haggart, 1971)

: A resource allocation technique which facilitates the organization and identification of the activities of an institution in terms of its objectives, displays the cost of these activities over an extended time frame, and relates these activities and their costs to the outputs of the institution's programs. The budgeting aspect of a PPBS. (Gulko, 1972, p. 120)

: Relates resources, financial and otherwise, to an organization's activities, outputs, services, missions, or programs; the financial expression of value priorities; helps to achieve cost-effectiveness if not cost-reduction; based upon a program structure classification; the budget is a statement of policy that relates cost to differentiated programs; sometimes used in a broad sense to denote the entire process of PPBS. (Hartley, 1968)

Program Structure: Organization of the general program areas, subprograms, elements, components, and tasks; it facilitates analytic comparisons of the costs and effectiveness of alternative programs. (Hartley, 1968, p. 257)

: A classification system that categorizes the activities of an organization according to their relationship to the organization's objectives. (Gulko, 1972, p.21)

Programming: The derivation of the specific projects or approaches to be used for achievement of an organization's goals or objectives after a thorough assessment of the relative merits or various alternatives. (Durstine and Howell, 1970, p. 8)

: The determination of the manpower, materials, and facilities required to support a program; inputs are related to outputs by lines of action through an information system. (Hartley, 1968, p. 256)

Requisition: A written request from on department in the school system to another department for materials or services. (Mitchell, 1964, p. 118)

Responsibility Center: An organization unit headed by a responsible person. The center is responsible for performing some function, which is its output, and for using resources, or inputs, as efficiently as possible in performing this function. (Lyden and Miller, 1972, p. 337)

Revolving Fund: A fund provided to carry out a cycle of operations. The amounts expended from the fund are restored from earnings from operations or by transfers from other funds so that the revolving fund remains intact. (Mitchell, 1964, p. 117)

APPENDIX B

Budget Forms Used by Cambridge School Department, 1974-75.

DIVISION: ______________________
ACCOUNTABLE UNIT: ______________ CODE ☐☐
MANAGER / DIRECTOR: ______________
PROGRAM: ______________________ ☐☐☐

CAMBRIDGE SCHOOL DEPARTMENT
OFFICE OF BUSINESS MANAGEMENT SERVICES
BUDGET REQUEST: FY ________
PROGRAM SUMMARY

DATE: DAY ☐☐ MO. ☐☐ YR ☐☐
☐ PRESENT LEVEL
☐ NEW OR EXPANDED

Program Description: (100 Words) ______________________

Progress This Year: (100 Words) ______________________

GOALS & OBJECTIVES, FY 1974-75:

Goal No. 1 ______________________

	ACTUAL 73-74	TARGETED 74-75
Objective 1A. ______________	______	______
Objective 1B. ______________	______	______

Goal No. 2 ______________________

Objective 2A. ______________	______	______
Objective 2B. ______________	______	______

Goal No. 3 ______________________

Objective 3A. ______________	______	______
Objective 3B. ______________	______	______

OBMS Form 200 1/74

DIVISION: ____________________

ACCOUNTABLE UNIT: ____________ CODE ☐☐

MANAGER / DIRECTOR: ____________

CAMBRIDGE SCHOOL DEPARTMENT
OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY ________

DATE: DAY ☐☐ MO ☐☐ YR ☐☐

☐ PRESENT LEVEL

☐ NEW OR EXPANDED

CODE OBJECT / PROGRAM CODE																			TOTAL
TOTAL																			

OBMS Form 210 1/74

DIVISION: ELEMENTARY
ACCOUNTABLE UNIT: ____________ CODE ☐☐
MANAGER / DIRECTOR: ____________

CAMBRIDGE SCHOOL DEPARTMENT
OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY ________

DATE: DAY ☐☐ MO. ☐☐ YR ☐☐
☐ PRESENT LEVEL
☐ NEW OR EXPANDED

		SALARIES		CONTR. SERV.		SUPPLIES							EQUIPMENT							
	CODE	A-1	A-2	B-2	B-81	D-9(1)	D-9(2)	D-18	D-19(1)	D-19(2)	D-19(3)	D-23	G-7	G-8	G-9					
PROGRAM CODE	OBJECT	Perm Salary	Temp & OT Salary	Postage	Transp. (Fld Trp.)	Ed. Sup. (Whse)	Food Supplies	Texts	Library Books	Library Supplies	Period & Newsp.	Instr. Supplies	School Furn	Ed./AV Equip	Office Furn./Eq					TOTAL
110	Kindergarten																			
112	Basic Sk 1-3																			
114	Basic Sk 4-6																			
116	Lang Art 7-8																			
118	Math 7-8																			
120	Science K-8																			
122	Social St. 7-8																			
124	Mod Lang 4-8																			
126	Phys Ed																			
128	Art																			
129	Drama Arts																			
130	Music																			
131	Cult Res.																			
132	Biling. - ESL																			
134	Occ Ed (Hm Ec)																			
136	Occ Ed (Shop)																			
138	Remed Rding																			
140	Counselling																			
142	Library																			
144	Athletics																			
146	Follow Thru																			
148	Gen Ins Sprt.																			
150	Elem Sch Mgt.																			
	TOTAL																			

OBMS Form 211 1/74

DIVISION : SECONDARY
ACCOUNTABLE UNIT: ____________ CODE ☐☐
MANAGER / DIRECTOR: ____________

CAMBRIDGE SCHOOL DEPARTMENT
OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY ______

DATE: DAY ☐☐ MO ☐☐ YR ☐☐

☐ PRESENT LEVEL
☐ NEW OR EXPANDED

PROGRAM CODE	CODE OBJECT	SALARIES		CONTR SERV.				SUPPLIES								EQUIPMENT				TOTAL
		A-1	A-2	B-1	B-2	B-42	B-81	D-9(1)	D-9(2)	D-18	D-19(1)	D-19(2)	D-19(3)	D-23	D-80	G-7	G-8	G-9		
		Perm Salary	Temp & O-T Salary	Printing & Binding	Postage	Grad. Serv.	Transp (Fld Trp)	Ed Sup. (Whse)	Food Supplies	Texts	Library Books	Library Supplies	Period & Newsp	Instr. Supplies	Lumber Supplies	School Furn	Ed /A.V. Equip.	Office Furn / Eq		
210	Lang Art																			
212	Math																			
214	Science																			
216	Social Studies																			
218	Mod. Lang																			
220	Occ Ed (Bus.)																			
222	Art																			
224	Music																			
226	Phys Ed																			
228	Biling - ESL																			
230	Occ Ed (Hm Ec)																			
232	Occ Ed (Ind)																			
234	Hlth & Sfty																			
236	Driver Ed																			
238	Drama Arts																			
239	Cult. Res.																			
240	Athletics																			
242	Guid. & Couns.																			
244	Library																			
246	Student Actvs																			
248	Occ Ed (Wk St)																			
250	Gen Ins Sprt.																			
252	Sec. Sch Mgt																			
	TOTAL																			

PECIAL EDUCATION
CCOUNTABLE UNIT: ____________ CODE ☐

CAMBRIDGE SCHOOL DEPARTMENT
OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY ________

DATE: DAY ☐ MO ☐ YR ☐
☐ PRESENT LEVEL
☐ NEW OR EXPANDED

ROGRAM DE	OBJECT CODE	SALARIES		CONTR. SERV				SUPPLIES			EQUIPMENT									TOTAL
		A-1	A-2	B-2	B-10(1)	B-81	B-91	D-9(1)	D-18	D-23	G-7	G-8	G-9							
		Perm Salary	Temp & O.T. Salary	Postage	Rental of Equip.	Transp (Fld Trp)	Health	Ed Sup (Whse)	Texts	Instr Supplies	School Furn	Ed /AV Equip	Office Furn /Eq							
1.0	Home Inst																			
1.5	Emot Dist																			
3.1	Percept Hdcd																			
3.3	Phys Hdcd																			
4.0	Mult Hdcd																			
4.5	Train M R																			
5.0	Educ M R																			
TOTAL																				

OBMS Form 213 - 1/74

CAMBRIDGE SCHOOL DEPARTMENT

OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY ________

DIVISION: ____________________

ACCOUNTABLE UNIT: ______________ ☐☐

MANAGER / DIRECTOR: ______________

DATE: DAY ☐☐ MO ☐☐ YR ☐☐

☐ PRESENT LEVEL

☐ NEW OR EXPANDED

OBJECT					REQUESTED	REVISION ________	REVISION ________	FINAL
SALARIES	A 1	Perm. Salary						
	A 2	Temp - OT. Salary						
	SUB TOTAL							
CONTRACTED SERVICES	B 1	Printing - Binding						
	B 2	Postage						
	B 4(1)	Travel in City						
	B 4(2)	Travel in State						
	B 4 4	Travel out of State						
	B 8 0	Testing Services						
	B 8 2(1)	Contrd. Inst. (Wkshp)						
	B 8 2(2)	Tchr. Stipend (Wkshp)						
	SUB TOTAL							
SUPPLIES	D 1	Ctrl. Office Supp.						
	D 9(1)	Ed. Supp. (Whse)						
	D 1 8	Textbooks						
	D 2 3	Instructional Supp.						
	SUB TOTAL							
EQUIP'T	G 8	Ed/AV Equip't						
	G 9	Off. Furn / Equip't						
	SUB TOTAL							
TOTAL								

OBMS Form 214 1/74

DIVISION: ____________________

ACCOUNTABLE UNIT: ____________ CODE ☐☐

MANAGER/DIRECTOR: ____________

TEMPORARY/OVERTIME SALARIES (A-2)

CAMBRIDGE SCHOOL DEPARTMENT

OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY ________

SUPPORTING DETAIL

DATE: DAY ☐☐ MO ☐☐ YR ☐☐

☐ PRESENT LEVEL

☐ NEW OR EXPANDED

TEMP or OVERTIME Group all temp first	PURPOSE / JUSTIFICATION	COMPUTATION / RATE	BUDGET REQUEST FY 74-75	EST. EXP. FY 73-74

OBMS Form 220 1/74

DIVISION: ____________________
ACCOUNTABLE UNIT: ________________ CODE ☐☐
MANAGER/DIRECTOR: ________________
CONTRACTED SERVICES (B-ITEMS)

CAMBRIDGE SCHOOL DEPARTMENT
OFFICE OF BUSINESS MANAGEMENT SERVICES
BUDGET REQUEST: FY ________
SUPPORTING DETAIL

DATE: DAY ☐☐ MO ☐☐ YR ☐☐
☐ PRESENT LEVEL
☐ NEW OR EXPANDED

OBJECT		PURPOSE / JUSTIFICATION	COMPUTATION / RATE	BUDGET REQUEST FY 74-75	EST. EXP FY 73-74
CODE	TITLE				

OBMS Form 221 1/74

DIVISION: ____________

ACCOUNTABLE UNIT: ____________ CODE ☐☐

MANAGER/DIRECTOR: ____________

EQUIPMENT (G-ITEMS)

CAMBRIDGE SCHOOL DEPARTMENT

OFFICE OF BUSINESS MANAGEMENT SERVICES

BUDGET REQUEST: FY________

SUPPORTING DETAIL

DATE: DAY MO YR ☐☐☐☐☐☐

☐ PRESENT LEVEL

☐ NEW OR EXPANDED

OBJECT		ITEM	PURPOSE / JUSTIFICATION	NEW/ REPL.	QUANTITY	EST. UNIT COST	EST. SUB TOTAL	TRADE IN	NET COST FY 74-75	EST EXP FY 73-74
CODE	TITLE									

OBMS Form 222 1/74

CAMBRIDGE SCHOOL DEPARTMENT

OFFICE OF BUSINESS MANAGEMENT SERVICES

ACCOUNTABLE UNIT:________ ☐☐ BUDGET REQUEST: FY__________ DATE: day | mo | yr

MANAGER/DIRECTOR:________ SUPPORTING DETAIL

☐ PRESENT LEVEL
☐ NEW OR EXPANDED

POSITION DETAIL (A-1)

PROGRAM		TITLE/POSITION	# of personnel in Full Time Equiv.		
code	title		current FY 73 - 74	proposed FY 74 - 75	difference

OBMS Form 223 1/74

CAMBRIDGE SCHOOL DEPARTMENT

OFFICE OF BUSINESS MANAGEMENT SERVICES

PERSONNEL WORK SHEET

DATE: day ____ mo ____ yr ____

☐ PRESENT LEVEL

☐ NEW OR EXPANDED

ACCOUNTABLE UNIT: ____________ BUDGET YEAR: ____________

MANAGER/DIRECTOR: ____________

	FY 1973 - 74			FY 1974 - 75			
Program/Grade	Current (Oct.) Enrollment	No. FTE Staff	Ratio	Projected (Oct.) Enrollment	No. FTE Staff	Ratio	Approved Staff

OBMS Form 224 1/74 ________ ________ ________

APPENDIX C

Sample Computer Reports for
Cambridge School Department Budget, 1974-75.

"1" stands
for Present
Level Only.

Report A

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1A 7

page #

		A02	TEMP+OT SAL	$23,040	
		D09	ED SUP(WHSE)	$250	
		D18	TEXTBOOKS	$350	
		D23	INSTR MATRLS	$350	$990,350
ACC UNIT 15 - KEN(GORE ST)					
110	KINDERGARTEN	A01	PERM SALARY	$7,875	
		D09	ED SUP(WHSE)	$55	
		D18	TEXTBOOKS	$50	
		D23	INSTR MATRLS	$55	
112	BAS SKLS 1-3	A01	PERM SALARY	$36,459	
		B81	TRANS OF STU	$69	
		D09	ED SUP(WHSE)	$175	
		D18	TEXTBOOKS	$350	
		D23	INSTR MATRLS	$150	
114	BAS SKLS 4-6	A01	PERM SALARY	$44,186	
		B81	TRANS OF STU	$68	
		D09	ED SUP(WHSE)	$175	
		D18	TEXTBOOKS	$350	
		D23	INSTR MATRLS	$150	
120	SCIENCE K-8	A01	PERM SALARY	$10,030	
		D18	TEXTBOOKS	$100	
		D23	INSTR MATRLS	$100	
124	MOD LA 4-8	A01	PERM SALARY	$4,359	
		D18	TEXTBOOKS	$60	
126	PHYS ED	A01	PERM SALARY	$4,905	
128	ART	A01	PERM SALARY	$2,693	
130	MUSIC	A01	PERM SALARY	$3,950	
134	OCC ED(HMEC)	A01	PERM SALARY	$2,006	
		D02	FOOD SUPP	$230	
138	REMED RDNG	A01	PERM SALARY	$12,680	
140	COUNSELLING	A01	PERM SALARY	$561	
142	LIBRARY	D06	LIBRY MATRLS	$110	
		D19	LIBRY BOOKS	$273	
		D86	PER & NEWSP	$300	
150	ELEM MGT SUP	A01	PERM SALARY	$19,687	
		B02	POSTAGE	$20	
		D09	ED SUP(WHSE)	$50	
320	SPEECH PROG	A01	PERM SALARY	$3,366	
		D18	TEXTBOOKS	$30	
		D23	INSTR MATRLS	$30	
330	PERCEPT HAND	A02	TEMP+OT SAL	$4,608	
		D09	ED SUP(WHSE)	$30	
		D18	TEXTBOOKS	$50	
		D23	INSTR MATRLS	$50	$160,445
ACC UNIT 16 - KENNEDY					
110	KINDERGARTEN	A01	PERM SALARY	$29,518	
		D09	ED SUP(WHSE)	$185	
		D18	TEXTBOOKS	$550	
		D23	INSTR MATRLS	$210	
112	BAS SKLS 1-3	A01	PERM SALARY	$155,232	
		D09	ED SUP(WHSE)	$679	
		D18	TEXTBOOKS	$1,944	
		D23	INSTR MATRLS	$729	

"3" stands for total program.

Report B

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3B 1                                  BUDGET SUMMARY

B.1 BY ACC UNIT DIVISION                          BUDGET           PCT

        10-28   ELEMENTARY DIVIS             $10,386,711          50.23
        30-39   SECONDARY DIVISI              $4,900,583          23.69
        40-58   LEARNING SUPPORT                $953,989           4.61
        80-87   BUSINESS MGT SER              $3,683,914          17.81
        90-98   SCHOOL DIST MGT                 $753,015           3.64
--------------------------------------------------------------------------
                                             $20,678,212
```

```
3B 2

B.2 BY PROGRAM LEVEL                              BUDGET           PCT

        ELEM EDUC                             $8,974,114          43.39
        SEC EDUC                              $4,566,774          22.08
        SPEC EDUC                             $1,856,962           8.98
        SUMMER SCH                               $19,021            .09
        ADULT EDUC                               $85,689            .41
        LEARN SUPP                              $738,723           3.57
        BUS MGMT                              $3,683,914          17.81
        DISTR MGMT                              $753,015           3.64
--------------------------------------------------------------------------
                                             $20,678,212
```

Report C

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3C 7            SCHOOL DIST MGT DIVISION

BY PROGRAM                               BUDGET            PCT

        810  PUBLIC REL                 $35,486            4.71
        820  PROG EVAL RE               $32,091            4.26
        830  COMPUTER SVC               $58,284            7.74
        835  PERSONNEL AD              $183,882           24.41
        840  ELEM SCH MGT               $92,508           12.28
        850  SEC SCH MGT                $59,993            7.96
        855  AD CON ED MG               $41,536            5.51
        860  BUSINESS MGT               $71,365            9.47
        870  SCH DEPT MGT              $101,613           13.49
        880  SCHOOL COMM                $76,257           10.12
    --------------------------------------------------------------
                                       $753,015

BY LINE ITEM                             BUDGET            PCT

        A01     PERM SALARY            $478,084           63.48
        A02     TEMP+OT SAL             $34,609            4.59
        B01     PRNTG BNDG              $27,663            3.67
        B02     POSTAGE                  $1,606             .21
        B03     ADVERTISING              $4,500             .59
        B04     TRAV IN CITY               $343             .04
        B06     RENT. EQPMT              $1,500             .19
        B22     MED SVCES               $21,500            2.85
        B39     OTHER SVCES              $7,336             .97
        B43     TRAV IN STAT             $8,410            1.11
        B44     TRAV OUT-STA            $36,000            4.78
        B75     CONTR NEGOT             $15,000            1.99
        B82     INSTR WKSOPS            $30,000            3.98
        B83     TCHR STIPEND            $24,000            3.18
        B87     ADMIN CONSLT             $2,000             .26
        B89     COMPUTER SVC            $40,876            5.42
        B94     NON-I EQ MAI               $400             .05
        B95     SCH PLNT MAI             $6,000             .79
        D01     CNT OFF SUPP             $2,377             .31
        D09     ED SUP(WHSE)               $375             .04
        D23     INSTR MATRLS             $2,631             .34
        D86     PER & NEWSP                $250             .03
        G04     MOTOR VEHIC              $3,500             .46
        G09     OFFCE FUR EQ             $4,055             .53
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                                       $753,015
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Report D

1D 1 DATE OF REVISION - 03/14/74

ACCT. NO.	OLD BUDGET	REVISED BUDGET	CHANGE
28-148-A01	-$263,000	-$193,000	$70,000
39-250-A01	-$83,380	-$53,380	$30,000
82-730-A01	$568,856	$468,856	-$100,000

DATE OF REVISION - 03/14/74

LINE ITEM	OLD APPROPRIATION	REVISED APPROPRIATION	CHANGE
A01	$222,476	$222,476	

Report E

2E 1 "2" stands for
New or Expanded
programs only.

BUDGET SUMMARY

E.1 BY ACC UNIT		BUDGET	PCT
10	AGASSIZ	$1,450	.09
14	HARRINGTON	$40,057	2.75
19	LONGFELLOW	$19,534	1.34
20	MORSE	$4,350	.29
28	ELEM SCH RES	$758,862	52.26
10-28	ELEMENTARY DIVIS	$824,253	56.76
30	C.H.L.S.	$69,676	4.79
33	PILOT SCHOOL	$9,000	.61
34	ACHIEVEMENT	$490	.03
36	EVE SCH-RTS	$600	.04
37	OTH AD OR EV	$1,064	.07
39	SEC SCH RES	$223,596	15.39
30-39	SECONDARY DIVISI	$304,426	20.96
40	LANG ARTS DI	$4,802	.33
41	MATH DIR	$4,002	.27
46	MUSIC DIR	$400	.02
51	CULT RES CO	$285	.01
52	BUR PUP SVCE	$123,672	8.51
53	BUR OCC ED	$3,250	.22
54	BUR TCH RES	$50,770	3.49
58	MOD LANG(BI)	$16,620	1.14
40-58	LEARNING SUPPORT	$203,801	14.03
80	ACCTG & PRCH	$15,100	1.03
83	PLANT MAINT	$30,763	2.11
80-87	BUSINESS MGT SER	$45,863	3.15
90	PUBLIC REL	$2,241	.15
96	SCH DEPT MGT	$41,536	2.86
98	PERSONNEL AD	$29,940	2.06
90-98	SCHOOL DIST MGT	$73,717	5.07
		$1,452,060	

Report X (A by L)

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3X  1  A X L                      BUDGET

   10 AGASSIZ

      A01    PERM SALARY        $270,912
      A02    TEMP+OT SAL          $2,862
      B02    POSTAGE                 $29
      B81    TRANS OF STU           $279
      D02    FOOD SUPP              $190
      D06    LIBRY MATRLS           $119
      D09    ED SUP(WHSE)         $1,020
      D18    TEXTBOOKS            $1,680
      D19    LIBRY BOOKS            $558
      D23    INSTR MATRLS         $1,477
      D80    LUMBER SUPP            $190
      D86    PER & NEWSP            $300
      G09    OFFCE FUR EQ           $450        $280,066

   11 FITZGERALD

      A01    PERM SALARY        $879,410
      A02    TEMP+OT SAL         $27,648
      B02    POSTAGE                 $95
      B81    TRANS OF STU         $1,262
      D02    FOOD SUPP            $1,550
      D06    LIBRY MATRLS           $185
      D09    ED SUP(WHSE)         $4,665
      D18    TEXTBOOKS            $9,262
      D19    LIBRY BOOKS          $2,523
      D23    INSTR MATRLS         $5,058
      D80    LUMBER SUPP          $1,550
      D86    PER & NEWSP            $300        $933,509

   12 FLETCHER

      A01    PERM SALARY        $382,917
      A02    TEMP+OT SAL          $9,216
      B02    POSTAGE                 $44
      B81    TRANS OF STU           $503
      D02    FOOD SUPP              $650
      D06    LIBRY MATRLS           $134
      D09    ED SUP(WHSE)         $1,765
      D18    TEXTBOOKS            $3,540
      D19    LIBRY BOOKS          $1,005
      D23    INSTR MATRLS         $1,855
      D80    LUMBER SUPP            $650
      D86    PER & NEWSP            $300        $402,579

   13 HAGGERTY

      A01    PERM SALARY        $236,121
      B02    POSTAGE                 $20
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Report X (A by P)

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   3X  1  A X P                       BUDGET

        10 AGASSIZ

                110 KINDERGARTEN          $11,434
                112 BAS SKLS 1-3          $57,505
                114 BAS SKLS 4-6          $37,021
                116 LA ARTS 7-8           $11,489
                118 MATH 7-8              $11,731
                120 SCIENCE K-8           $16,251
                122 SOC ST 7-8             $7,294
                124 MOD LA 4-8             $3,599
                126 PHYS ED               $13,188
                128 ART                    $4,432
                130 MUSIC                  $2,244
                132 BILING-ESL             $1,159
                134 OCC ED(HMEC)             $190
                136 OCC ED(IND)            $1,849
                138 REMED RDNG            $10,924
                140 COUNSELLING           $11,069
                142 LIBRARY               $14,290
                148 GEN INS SUPP             $940
                150 ELEM MGT SUP          $27,604
                320 SPEECH PROG            $2,965
                325 EMOT DISTURB          $14,898
                330 PERCEPT HAND          $17,990        $280,066

        11 FITZGERALD

                110 KINDERGARTEN          $31,420
                112 BAS SKLS 1-3         $170,508
                114 BAS SKLS 4-6         $174,046
                116 LA ARTS 7-8           $55,069
                118 MATH 7-8              $35,718
                120 SCIENCE K-8           $34,825
                122 SOC ST 7-8            $27,553
                124 MOD LA 4-8            $19,602
                126 PHYS ED               $26,842
                128 ART                   $16,658
                130 MUSIC                 $25,916
                132 BILING-ESL             $4,830
                134 OCC ED(HMEC)          $18,244
                136 OCC ED(IND)           $18,244
                138 REMED RDNG            $38,554
                140 COUNSELLING           $22,278
                142 LIBRARY               $30,259
                148 GEN INS SUPP           $1,262
                150 ELEM MGT SUP          $77,963
                320 SPEECH PROG           $10,704
                325 EMOT DISTURB           $6,264
                330 PERCEPT HAND          $86,749        $933,508
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Report X (L by A)

3K*13 L.K A		BUDGET	
	34 PLANT OPERNS	$4,341	$4,341
016	OTH SUPPLIES		
	28 ELEM SCH RES	$3,153	
	39 SEC SCH RES	$37,207	$40,360
018	TEXTBOOKS		
	10 AGASSIZ	$1,680	
	11 FITZGERALD	$9,262	
	12 FLETCHER	$3,540	
	13 HAGGERTY	$2,060	
	14 HARRINGTON	$9,180	
	15 KEN(GORE ST)	$990	
	16 KENNEDY	$8,100	
	17 KING	$6,369	
	18 LINCOLN	$1,520	
	19 LONGFELLOW	$5,910	
	20 MORSE	$3,990	
	21 PEABODY	$4,730	
	22 ROBERTS	$4,695	
	23 TOBIN	$8,090	
	24 WEBSTER	$2,770	
	25 LOWELL ST.	$130	
	27 C.A.P.S.	$1,585	
	28 ELEM SCH RES	$22,587	
	30 C.H.L.S.	$19,430	
	31 RINDGE TECH	$7,010	
	32 WAR MEMORIAL	$50	
	33 PILOT SCHOOL	$1,800	
	34 ACHIEVEMENT	$1,760	
	35 EVE SCH-CHLS	$370	
	36 EVE SCH-RTS	$600	
	37 OTH AD OR EV	$1,382	
	39 SEC SCH RES	$6,186	
	40 LANG ARTS DI	$150	
	41 MATH DIR	$500	
	42 SCIENCE DIR	$300	
	43 SOC ST DIR	$500	
	52 BUR PUP SVCE	$2,450	
	53 BUR OCC ED	$400	$140,076
019	LIBRY BOOKS		
	10 AGASSIZ	$558	
	11 FITZGERALD	$2,523	
	12 FLETCHER	$1,005	
	13 HAGGERTY	$582	
	14 HARRINGTON	$2,514	

Report X (L by P)

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3X 12  L X P                          BUDGET

          720 PAYROLL                   $100
          730 FOOD SVCE                 $100
          820 PROG EVAL RE              $100
          835 PERSONNEL AD              $150
          840 ELEM SCH MGT               $50
          860 BUSINESS MGT               $25
          870 SCH DEPT MGT               $50        $38,394

D11   GAS AND OIL

          236 DRIVER EDUC               $850
          450 DRIVER EDUC                $90
          740 PLANT MAINT               $175
          785 SUPPLY DISTR              $375         $1,490

D13   CHEMICALS

          745 PLANT OPERNS            $4,341         $4,341

D16   OTH SUPPLIES

          144 ATHLETICS               $3,153
          240 ATHLETICS              $37,207        $40,360

D18   TEXTBOOKS

          110 KINDERGARTEN            $4,648
          112 BAS SKLS 1-3           $16,843
          114 BAS SKLS 4-6           $17,872
          116 LA ARTS 7-8             $6,616
          118 MATH 7-8                $7,081
          120 SCIENCE K-8             $5,394
          122 SOC ST 7-8              $8,373
          124 MOD LA 4-8              $2,624
          126 PHYS ED                   $154
          128 ART                       $200
          129 DRAMATIC ART              $184
          130 MUSIC                   $3,737
          131 CULT RES                  $132
          132 BILING-ESL              $5,331
          138 REMED RDNG              $2,791
          140 COUNSELLING               $726
          142 LIBRARY                   $100
          148 GEN INS SUPP              $336
          150 ELEM MGT SUP              $180
          210 LANG ARTS               $5,400
          212 MATHEMATICS             $3,873
          214 SCIENCE                 $2,700
          216 SOC STUDIES             $4,170
          218 MOD LANG                $3,220
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Report X (P by A)

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3X  9  P X A                    BUDGET

    214 SCIENCE

            30 C.H.L.S.          $155,092
            31 RINDGE TECH        $96,102
            34 ACHIEVEMENT        $13,096
            39 SEC SCH RES        $21,329        $285,619

    216 SOC STUDIES

            30 C.H.L.S.          $234,627
            31 RINDGE TECH        $98,643
            33 PILOT SCHOOL       $27,133
            34 ACHIEVEMENT        $23,005
            39 SEC SCH RES         $4,100        $387,508

    218 MOD LANG

            30 C.H.L.S.          $140,840
            31 RINDGE TECH        $10,060
            33 PILOT SCHOOL       $13,589
            39 SEC SCH RES         $1,900        $166,389

    220 OCC ED (BUS)

            30 C.H.L.S.          $248,489
            39 SEC SCH RES         $8,631        $257,120

    222 ART

            30 C.H.L.S.           $50,505
            31 RINDGE TECH        $58,841
            33 PILOT SCHOOL       $12,065
            34 ACHIEVEMENT         $5,476
            39 SEC SCH RES         $9,350        $136,237

    224 MUSIC

            30 C.H.L.S.           $29,325
            31 RINDGE TECH         $5,660
            34 ACHIEVEMENT         $3,424
            39 SEC SCH RES        $19,425         $57,834

    226 PHYS ED

            30 C.H.L.S.          $112,410
            31 RINDGE TECH        $44,220
            32 WAR MEMORIAL       $19,442
            34 ACHIEVEMENT        $11,428
            39 SEC SCH RES         $8,280        $195,780
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Report X (P by L)

2X 5 P X L		BUDGET	
A01	PERM SALARY	$40,000	
D18	TEXTBOOKS	$400	
D23	INSTR MATRLS	$400	$40,800
325 EMOT DISTURB			
A01	PERM SALARY	$10,244	
D18	TEXTBOOKS	$100	
D23	INSTR MATRLS	$100	$10,444
330 PERCEPT HAND			
A01	PERM SALARY	$20,440	
A02	TEMP+OT SAL	$81,792	
D18	TEXTBOOKS	$660	
D23	INSTR MATRLS	$660	
G09	OFFCE FUR EQ	$166	$103,718
335 PHYS HAND			
A01	PERM SALARY	$16,220	
A02	TEMP+OT SAL	$17,280	
D18	TEXTBOOKS	$330	
D23	INSTR MATRLS	$330	$34,160
355 CENT MED SVC			
A01	PERM SALARY	$21,000	$21,000
360 CEN MENTAL H			
A01	PERM SALARY	$70,000	
G07	SCHOOL FURN	$2,650	$72,650
365 CENT COUNS			
A01	PERM SALARY	$27,245	$27,245
375 B.P.S. MGT			
A01	PERM SALARY	$71,447	
B02	POSTAGE	$2,700	
B39.4	OTHER SVCES	$35,000	
B82.1	INSTR WKSOPS	$5,000	
D01	CNT OFF SUPP	$1,000	
D09.1	ED SUP(WHSE)	$800	
D18	TEXTBOOKS	$1,450	
D23	INSTR MATRLS	$1,450	
G09	OFFCE FUR EQ	$4,825	$123,672